JULY 20, 1929

Railway Age

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Transportation by rail and air on less-than-forty-eight-hour daily schedules is now a reality. The recently inaugurated services of this nature by the Pennsylvania and Santa Fe on the Lindbergh Line, and the New York Central and Santa Fe on the Great Circle Route again place the steam railways in the position of pioneers in bringing our two coasts closer together with regular scheduled transportation.

The July issue of *Airway Age,* a sister publication of the *Railway Age,* describes in detail the T. A. T. Rail-Air Service in a special 64-page insert containing eight comprehensive illustrated articles and signed statements by C. M. Keys, President, the Transcontinental Air Transport; W. W. Atterbury, President, the Pennsylvania Railroad; and W. B. Storey, President, the Atchison, Topeka and Santa Fe Railway Company.

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This is one of a series on International Tie Service. How International ties reduce annual tie renewals will appear in the August 3rd issue.

Sound and Safe Track

International quality ties provide a uniform, safe and easy riding track structure. They are always full size, free from decay, thoroughly treated—the kind that puts the maximum amount of sound timber and a solid foundation under the rails. The sound timber provides a firmer and more permanent grip for spikes to hold the rails to gage.

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International

High Quality 2IC9 Treated Ties

"The International Dating Nail"

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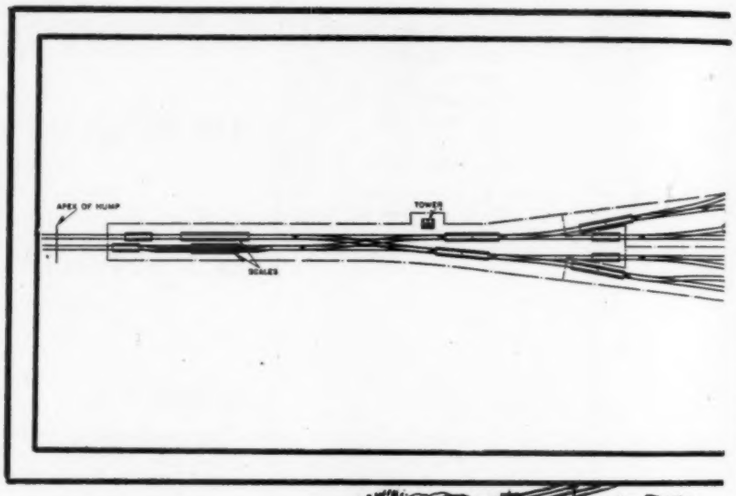
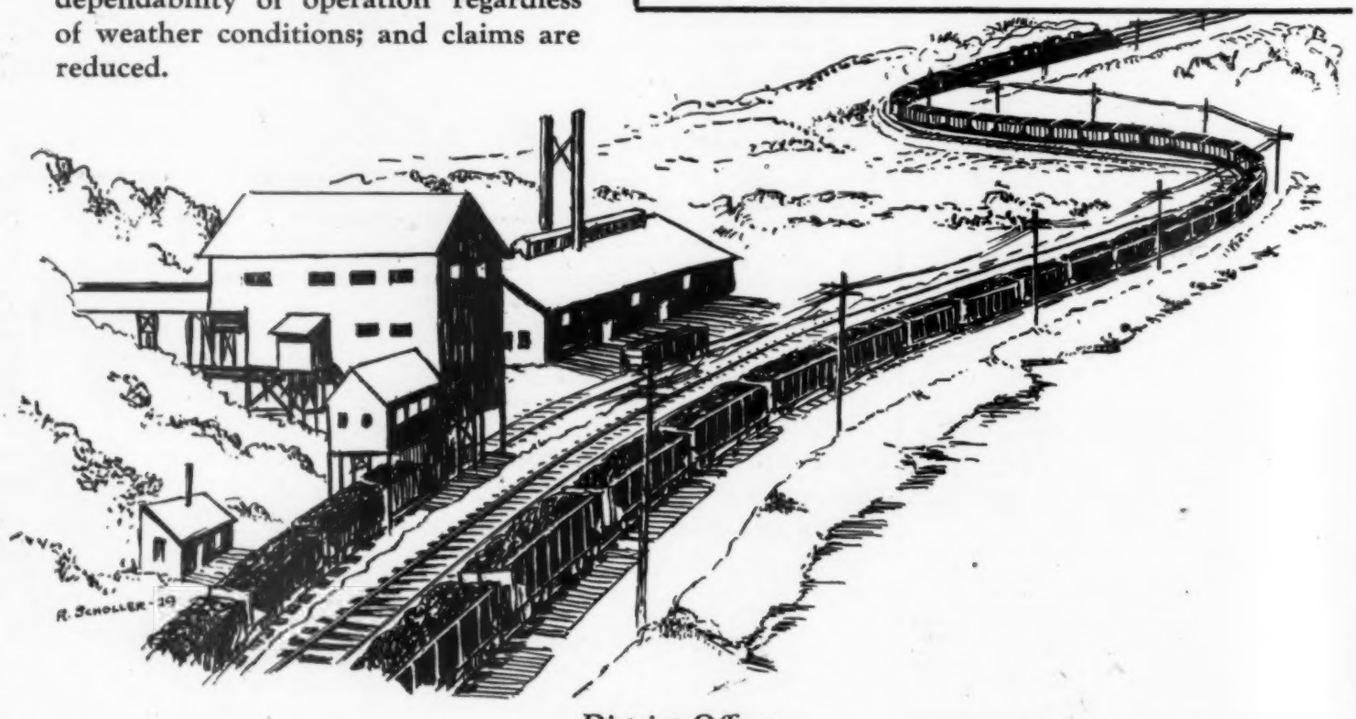
From Mines to Lake Docks Through Russell Yard

To Russell Westbound Yard of the Chesapeake and Ohio Railroad come every day hundreds of cars of coal from the Kentucky fields destined for the Great Lakes ports. Classifying these cars without delay has required a large force of riders and, of course, the various aids to their efficiency such as the rider car and the extra rider car track.

Despite the efficiency of the yard under rider-operation the force of riders will be replaced by "Union" Electro-Pneumatic Retarders. The riders will be relieved for other duties; the rider car and its maintenance eliminated; the rider track used for classification purposes. By this means the operation costs of the yard are cut to a fraction of their former value; there is absolute dependability of operation regardless of weather conditions; and claims are reduced.

The "Union" Model 28 Electro-Pneumatic Retarder is the most powerful developed. It meets every demand in its ability to stop heavy cars moving at high speeds, because of its flexibility of operation and strength of construction.





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NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

Railway Age

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The Growth of Traffic

WHAT is the trend of traffic is a question of great importance to both the railways and the public. It is an indication of the enlargements and improvements the railways should make to handle future business. It also throws light on the question of what expenditures the public may be justified in making on waterways, and even on highways. It is contended by waterway enthusiasts that a large system of inland waterways should be developed to help handle future traffic which the railways cannot be sufficiently expanded to handle. It is also contended that waterways should be developed because, as is claimed, they will be able to handle freight cheaper than the railways. It is an economic question of great importance, however, whether, in case the increased traffic of the future is divided between the railways and the waterways, the savings, if any, that are made by handling part of the traffic by water will not be more than offset by the enhancement of the cost of transportation by rail that will result from depriving the railways of traffic that otherwise would go to them.

Doctor M. O. Lorenz, director of statistics of the Interstate Commerce Commission, recently has submitted to the commission a report entitled, "Growth of Traffic on Steam Railways of the United States, 1900-1928," a summary of which is published elsewhere in this issue. The report shows, of course, that since 1920 there has been a large decline in passenger business. The *Railway Age*, on several occasions within recent years, has presented data, and conclusions drawn from them, indicating that since the beginning of the World War, and especially since the war, the rate of growth of freight business has been less than it was before. We thought the facts we gave demonstrated this beyond question and were surprised, therefore, when efforts were made in some quarters to show we were wrong, and statements and data attributed to the office of the Interstate Commerce Commission were cited to confute us. Doctor Lorenz now states positively that the details given by him "show that the rates of growth of railway traffic have diminished." In the 14 years ending with 1914 the average annual growth of freight business was 10.5 billion ton miles, and in the 14 years ending with 1928, 10.2 billion ton miles. The absolute growth having been slightly less in the second than in the first period, the relative growth was, of course, much smaller. The increase in freight business in the years 1900-1914 was about 100 per cent, and the years 1914-1928 only about 50 per cent. The average annual growth in 1900-1914 was 4.98 per cent and in 1914-1928 only 2.89 per cent.

No less significant are statistics relating the growth of traffic to the increase of population. In 1900 ton miles per capita were 1,860, and in 1914 they were 2,947, an increase of 1,087, or 58 per cent. In 1928 ton miles per capita were 3,635, or 688 more than in 1914, an increase of only 23 per cent.

The most gigantic single change in American industry during the periods covered has been the development of the automobile industry. This has affected the railways in two ways. It has given them a large amount of freight business, but has caused them to lose a large amount of passenger business. The question has been debated a good deal as to which effect on the railways has been the more important. Doctor Lorenz gives some interesting figures bearing on this question. In 1928 the Class I roads received $194,111,044 for the carrying of passenger automobiles and auto trucks and parts, including tires, and Doctor Lorenz estimates that they received $322,000,000 in revenues from carrying materials entering into the manufacture of motor vehicles and materials used in road building. "There is, then," he says "a total of 516 million dollars of railroad freight revenue resulting from the growth of the automotive industry." He estimates that if passenger business had increased since 1915 as it did in an equal period before "the passenger revenue of 1928 would have been 1,516 millions of dollars, as compared with the estimated revenue of 904 millions, a decline of 612 millions. Thus the net reduction in gross revenue from these factors is 96 million dollars per annum." This takes no account of revenues lost because of motor truck competition. The railways have had to provide facilities and incur operating expenses to handle the freight business derived from the automotive industry, while they have not been able to reduce their passenger service in proportion to the loss of passenger business. Consequently, the increase in their net earnings that has been caused by the freight business that has come to them owing to the growth of the automobile industry undoubtedly has been much less than the reduction of their net earnings that has been caused by the loss of passenger business.

The foregoing facts are cited, not in any attempt to show that the development of the automobile industry has been undesirable—which, of course, would be absurd—but to call attention to the effects that may be produced upon the railways by diverting traffic from them. The diversion of traffic from them by the motor truck in congested areas unquestionably has benefited them by enabling them to effect economies in operation and improve their service. On the other hand, the diversion of passenger business from them has, in most territories, deprived them of earnings without enabling them to make compensating economies, the net result being that they require higher freight and passenger rates to enable them to earn a fair return than they would have required if they had not lost this business.

The fact that freight business is not growing relatively or even absolutely as rapidly as it did before the war, and that shortages of transportation have been virtually unknown for six years, show that if waterways were needed at times before the war to "relieve" the railways, they are not needed now, and that developments before the war afford little or no evidence that they will be needed in future. Freight business will continue to grow; but it probably will continue to grow at a declining rate; and there can be no serious question that if the railways are allowed to earn reasonable net returns they will be able to expand their facilities in future sufficiently to handle all available freight business. The question as to the desirability of the development of waterways hinges entirely upon whether this policy will reduce the total costs of transportation that will have to be paid by he American public. The more traffic the railways are given the more economically they will be able to handle each unit of it. To whatever extent the development of waterways diverts from the railways traffic that they otherwise would have a chance to handle, it will tend to make higher than they otherwise would be the rates that must be paid upon the traffic actually handled by rail, for the same reason that the losses of passenger business since 1920 have made and still make the rates needed by the railways higher than they otherwise would have been.

Why Some Members Drop Out

CERTAIN of those technical associations of railway officers that are not affiliated officially with the A.R.A. are confronted each year with a loss of members through non-payment of dues. This difficulty cannot be ascribed to a decadent condition in these organizations in the face of an increase in attendance at conventions, a steady improvement in the character of work done and the fact that the number of new members initiated each year usually more than compensates for the number who drop out.

An analysis of the delinquencies in one of these associations discloses the primary reason for them,—viz., that a member retains interest only in proportion to the regularity of his attendance at the annual conventions. Those who do not or cannot attend soon drop out, and on some railways the supervisory officers are either not permitted to absent themselves to go to conventions, or are given little encouragement to do so. If this condition were general, it would be easy to understand. The supervisory officer renders a service that is largely personal in character, and when he is absent this service ceases. Moreover, if the convention is held at a place remote from his headquarters, the period of absence necessary for attendance may be from ten days to two weeks. But in view of the fact that certain roads are always represented at these annual conventions either by the same men or by others who alternate with them, it is evident that their managements consider the associations well worth while.

Either these associations and their annual conventions are of definite value to the railways collectively and individually, or they are not. If they are not they should be disbanded. If they are they deserve the support of all the railways in proportion to the proximity to their usual places of meeting. In view of the recognition and encouragement which these associations have received from the A.R.A. and from many of the individual railways, the other roads should give them a trial. The requirement that those who attend prepare and submit reports on what they see and hear will afford adequate evidence upon which to judge whether the association and its convention are worth while and whether or not the particular individual is so constituted as to benefit from attendance.

Producer Responsibility for Ties

IN a letter to the editor which is published on a following page in this issue, H. R. Condon, vice-president and general manager of the Delaware Wood Preserving Company and formerly forester of the Pennsylvania, takes exception to a suggestion which we made editorially in our issue of May 4, to the effect that producers of crossties should be encouraged to grade mark and identify their ties, as a means of raising the standards of production and of eliminating the wide-spread variation that now exists in inspection. In his letter Mr. Condon refers to the difficulty of applying our suggestion to the many small wood lot operators who produce ties locally along the right-of-way. To the extent that such production is a factor, his point is of course, well taken. However, this production is decreasing steadily from year to year, and, taking the railways of the country as a whole, is no longer a large factor, for the gradual recession of the forests is forcing the railways to depend more and more on off-line production for their requirements. This, in turn, is leading to the concentration of sales in the hands of the larger tie producing companies.

The problem is, therefore, essentially one concerning these larger companies, among whom Mr. Condon states that the necessity would arise for the organization and training of an inspection force if their output was to be graded dependably. However, most of these companies now buy a large part or all of their ties from small woods operators and for their own protection inspect these ties with at least the same rigidity as their customers will later, preliminary to accepting them and taking them into their own stocks for sale to the railways. Efficient inspection organizations are, therefore, already in existence and functioning for most of these large vendor organizations. Mr. Condon also states that producer inspection must be subject to check if the customer is to be protected, a point which we suggested in our earlier editorial, although with the hope that as producer responsibility became more thoroughly developed this check inspection would ultimately need to be only casual.

The point which we desire to make in this discussion is that present methods of buying and inspecting ties leave much to be desired. A prominent tie producer summarized the present situation recently in the statement that "Too many purchasing agents are ever ready to adopt a subterfuge to establish a reputation with their superiors as close buyers who are able to obtain standard articles at less than current market values. On the other hand, there are always vendors ready and anxious to sell under those conditions, knowing that inspection practice or lack of it will make the transaction a thoroughly satisfactory one from their viewpoint." It is this situation that we believe should be corrected. We feel that one step in its correction will be for the railways to encourage producers to take more responsibility for the quality of their product by identifying it permanently as to grade and origin so that it can be noted as their product throughout its life, in the same manner that many other trade marked products are identified in railway service today.

Change in Police Activities

FOR some years there has been a marked change in the attitude of the railway police departments. Instead of being concerned only with the apprehension of criminals, railway police have been active in the prevention of crime. The success of the new plan is indicated by the showing made in 1928, when the loss to the railways from freight-car robberies was reduced to 1.8 cents per car. During the year railway police obtained convictions on 97 per cent of the arrests made, a record which cannot even be approached by the police department of any municipality. This high percentage of convictions indicates that the railway police know their business.

People with predatory tendencies no longer look upon railway yards as a fruitful source of unlawful revenue. They have found that their chances of escaping punishment are much greater if they confine their activities to other fields. At the same time, youths who might end up as hardened criminals, are being turned into honest citizens by the removal of temptation, and, if they do commit minor crimes, they are treated with understanding and care, rather than given ruthless punishment.

Merchandising Railway Service in Great Britain

ADDRESSING a recent British advertising convention on "The Quest of Markets," Sir Ralph Wedgwood, chief general manager, London & North Eastern Railway, once more dispelled the somewhat prevalent idea that the railway industry is a sheltered one with ready-made markets which need no cultivation. "In a very literal sense," he said, "the railways must no go into the highways and byways . . . . We still scramble with one another for our share of the feast, though the enemy, as represented by the motor coach, is at our gates . . . . The market, the traveling public, is open to both of us; there is no shelter in established custom—it is advertisement, efficiency and service which decide the battle which is always renewed and never settled."

Sir Ralph continued to sketch the growth of railway competition and the development of government regulation in Great Britain. He pointed out that the present law, requiring a return of four-fifths of excess earnings over standard returns to the public in the form of reduced rates, sets up a plan of sharing railway profits with patrons, and held that "for this reason the public as well as the railway industry is concerned in the quest of markets by the railways—for to increase the volume of our business is in fact the most hopeful and fruitful way of increasing our net revenues."

The speaker next turned to the methods employed by British railroads to accomplish this latter and spoke particularly of their advertising campaigns. The London & North Eastern, he said, spends £1,000 a day on advertising of all types, almost one-half of which is devoted to the purchase of newspaper display space. The address included also a survey of improved railway services and a list of new equipment designed to meet the needs of the public—for the British railways, he added "are devoting an unprecedented amount of effort to producing a good article, and the requirements of the market are being studied as never before."

Finally when he said, "We are the servants of the public and we must give the public the service that it wants or go under," Sir Ralph reached the same conclusion regarding proper railway policy under present transportation conditions as was stressed in the recent address of General W. W. Atterbury, president of the Pennsylvania, as reported in the *Railway Age* of May 25, page 1207.

Eliminating "Walking Tours"

THE announcement by the Southern Pacific of its plans for the installation of inter-car telephone communication on one of its Pacific Coast trains, the Cascade, represents another innovation in the efforts of the railroads to minister to the comfort of passengers on long trips. As the length of trains has increased, the physical exertion and discomfort involved in a walk of seven or eight car lengths to the diner, only to find that no seats will be available for several minutes, are considerable. The passenger's consequent journey back to his Pullman section or to the club or observation car does little to promote his love for the railroad he is on.

This telephone system should go far toward eliminating unnecessary steps on passenger trains and should effectively silence passengers who sarcastically enjoy referring to their latest railway trip as a "walking tour." Aside from the increased enjoyment of the ride by the passenger, the innovation should result in increased efficiency on the part of the porters and other attendants on the train, for by decreasing the time that they must spend in running errands that could more easily be performed by telephone they will be given greater opportunity to devote their attention to the passengers' comfort.

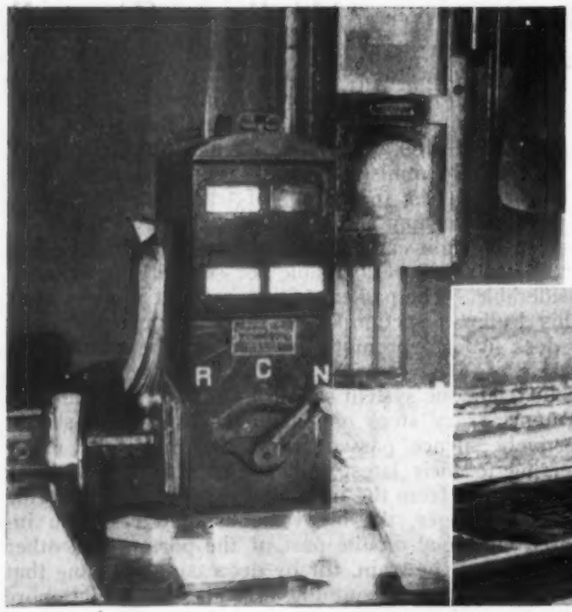
The Wheel That Squeals

"THE wheel that squeals gets the grease." This trite but true saying, of unknown origin, conveys a real message which seems in a fair way to be overlooked by railroad officers, particularly in the mechanical department. A recent survey indicates that while many railroad repair shops are now equipped with the finest modern production machinery, many other shops still struggle along with tools which are appallingly limited in power range of work, and productive capacity. Antedating the introduction of high-speed steel, and in some cases even the Civil War, the continued presence of some of these tools in railroad shops cannot but be regarded as a reflection on management, in most cases that of local shop supervision.

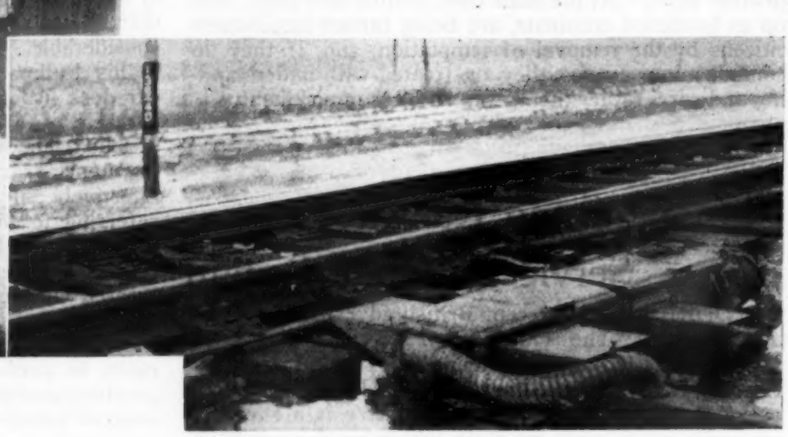
The supervisors have no doubt asked for new replacement machines, but neglected to set forth their arguments forcefully enough and often enough. While it is easy for a shop foreman or superintendent to say, "If the boss doesn't care, why should I worry?" the management is responsible for investing money in railroad improvements which will bring the highest return, and it has a right to assume that if foremen stop asking for new tools, these tools are not greatly needed. A wheel with defective bearings continues to protest by squealing until it receives the proper attention and an adequate supply of grease. It cannot be questioned that many railroad mechanical department officers and shop supervisors may well follow the example of the wheel and "squeal" louder and more persistently.

Big Four Improves Operation

Principal passing tracks equipped so as stops at



Desk-lever Machine at Gays



Typical Power Switch Machine

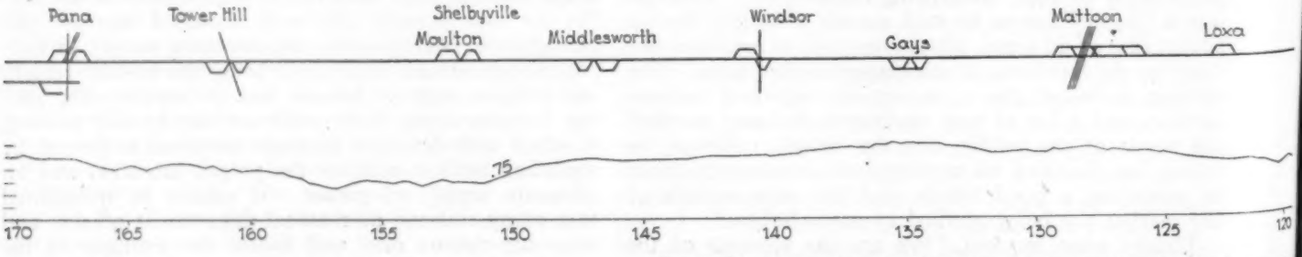
By J. H. Westbay

Special Engineer to General Superintendent, Cleveland, Cincinnati, Chicago & St. Louis, Indianapolis, Ind.

ON the 96 miles of single track extending between Terre Haute, Ind., and Pana, Ill., on the St. Louis division of the Cleveland, Cincinnati, Chicago & St. Louis, nearly all of the passing track switches are now operated either from interlocking plants or by remotely-controlled, power-operated switch machines, so that the stopping of trains to handle switches is practically eliminated. Besides the distinct advantage of saving time, the use of these switches also results in a reduction in wear and tear on equipment and a saving of fuel.

The main line of the St. Louis division of the Big Four extends from Indianapolis, Ind., to East St. Louis, Ill., a distance of 248.7 miles. The line is double tracked from Indianapolis to Terre Haute, Ind., 71.6 miles, and from Pana, Ill., to E. St. Louis, 81.6 miles. The intervening section between Terre Haute and Pana, 95.5 miles, is single track except for 1.5 miles of double track through Mattoon, Ill. This 95.5 miles of single track is, therefore, the "neck of the bottle" for this division. Division headquarters are at Mattoon, 128 miles west of Indianapolis, Mattoon being the terminal for all crews in freight service and for engine crews in passenger service.

Between Terre Haute and Pana the line traverses a rolling prairie country. The ruling grade in the westward direction on the single track is encountered in the ascent from the Wabash River valley a short distance west of Terre Haute, where a one per cent grade extends for a distance of about two miles, followed by a 0.77 per cent grade for approximately the same distance. Near the top of the one per cent grade is a reverse curve, each section of which is approximately three degrees. The remainder of the grade is on tangent track. The ruling grade in the eastward direction is 0.75 per cent, extending for about two miles east from Shelbyville, Ill., and on this grade are two curves, each of two degrees. The remainder of the single-track district



Track Plan Showing the Location of the Stations and the Passing

By Remote Control

of Switches and Signals

on 96 miles of single track to eliminate train switches

Signaling at Typical Siding

Train Heading in at West End of Gays

is broken by short grades that offer no serious obstacle to train movements.

Traffic Handled on Fast Schedules

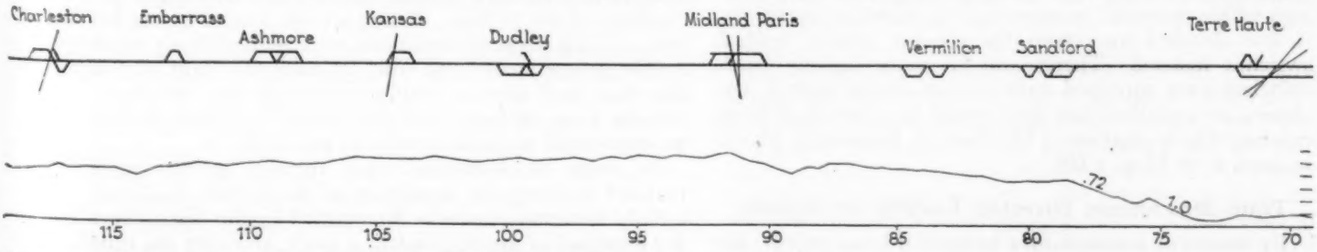
The operation of this section of single track is complicated by the preponderance of passenger as compared with freight trains, both of which are operated on high-speed schedules. Thirty scheduled trains are operated over this district daily, including nine passenger, five through freight and one local freight in each direction. In addition to these trains, extras are run whenever traffic warrants. With the exception of one local train daily in each direction, the passenger trains are operated on fast schedules with few stops. The freight traffic consists largely of merchandise, manufactured products, meats, livestock and agricultural products and is moved for the most part in trains which are run on fast schedules that do not permit the handling of the maximum tonnage. The preponderance of this traffic is eastbound.

Fast freight trains are hauled by heavy locomotives of the 4-8-2 type, and heavy 2-8-2 type engines are used on the other through freight trains. Pacific-type locomotives are regularly used on all except local passenger trains. The through passenger trains consist ordinarily of from 10 to 12 cars, but during periods of heavy travel they may consist of as many as 16 cars.

Why Remote Control Was Used

In this 96-mile territory between Terre Haute and Pana, other railroads cross the Big Four at grade at Midland (Paris), Kansas, Charleston, Karl (Mattoon), Windsor, Tower Hill and Pana. At each of these crossings, interlocking plants have been in service for years, and except at Karl, one end of a passing track was connected into and operated by each plant. Likewise at Sandford, Vermilion, Dudley, Ashmore, Gays, Middlesworth and Moulton small interlocking plants have been in service for years to handle one end of each passing track.

Automatic block signals operating on the A. P. B. principle were installed between Terre Haute and Pana in 1926. Coincident with this signal installation, an electric switch machine was installed at the west switch of the passing track at Charleston, the control being lo-



Tracks As Well As the Grades Between Terre Haute and Pana

cated in the tower at that point, and similar switch machines were provided for the two switches at the west ends of the two passing tracks at Tower Hill, with the control in the tower. These locations were chosen for the initial installation of remote control power switch machines on account of the adverse grades encountered by trains entering or leaving these sidings.

The advantages afforded to train operation by the three remote control switches were at once apparent. For example, it was found that eastbound freight trains could be advanced from the end of the double track at Pana into the passing track at Tower Hill in about 10 min. less time than was required when the trains had to be brought to a stop and the switch operated by hand. This fact made it possible frequently to advance a meeting point, and was of material assistance in shortening the average time it took freight trains to move over the division.

Increased Difficulties of Schedules

Since 1925, traffic on the St. Louis division of the Big Four has undergone a material change. During that year and the year following, coal tonnage produced in Indiana and Illinois fields decreased materially, and has never returned to its former volume. But as this decrease continued, there came a pronounced increase in higher class freight which had to be moved on relatively faster schedules, and this change in the character of the freight traffic brought with it a corresponding change in the character of freight trains on the St. Louis division. Where formerly the bulk of the freight traffic moved in tonnage trains on relatively slow schedules, it is now moving in symbol trains on fast schedules and the efforts of the operating staff are directed to the maintaining of these schedules.

At the time of the change in character of freight traffic, there came a somewhat similar but far less pronounced change in the character of passenger traffic. The hard roads which parallel the division attracted almost all of the local passenger and express traffic, leaving relatively little to be handled by rail. But while the line was losing its local business there was an increase in through passenger traffic, and to meet the demands of this service, through service between St. Louis and New York was extended in 1925 and in 1927 there was a further extension of this service by the addition of another extra-fare train in each direction. This increase in passenger train movements naturally added to the problems in moving the traffic over the 96 miles of single track.

The benefits which had been realized from the use of the remote control switches at Charleston and Tower Hill, together with the need for speeding up the movement over the single track were responsible for a study to determine some means whereby traffic might be further expedited. Some consideration was given to the idea of using the centralized dispatcher-controlled system of this division, but in view of the fact that there are so many interlocking plants at railroad crossings where it would be necessary to maintain operators, it was decided to extend the use of remote control switches instead. Thereupon, 13 more passing track switches were equipped with remote-control switch machines, so installed that they could be controlled from existing block stations. The last of these was placed in service in May, 1928.

Train Movements Directed Locally by Signals

By means of annunciators located in block offices, the operators are advised of the approach of each train. They, in turn, notify the dispatcher immediately, and in the case of meets, he issues instructions to the operator that specify which train should take siding. The switches are then lined up accordingly. Thus, although train movements are governed in general by train orders, each individual meet is executed in accordance with local conditions which obtain at the moment and is directed largely by signal indication. By use of the remote-control switches, together with take-siding and starting signals, non-stop meets are everyday occurrences.

In order to determine the time saved to a tonnage train by the use of remote-control switches in heading into or out of a siding, a series of tests was made which showed that a train could be headed into a siding from 4 min. 8 sec. to 6 min. 45 sec. sooner by the use of the switch machine than by manual switch operation. The time saved in heading out ranged from 6 min. 45 sec. to 9 min. The average time saved in heading in was 5 min. 36 sec. and in heading out was 7 min. 53 sec. These savings cannot, however, be taken as a criterion for estimating the benefits to be derived from remote-control switch installations at every location for they apply only at the particular points where the tests were made. The grade over which the train moves while pulling into or away from the siding is the governing factor in determining the time that can be saved by a switch machine.

In order to arrive at the foregoing estimates of time saved, a check was made of the time consumed by a number of tonnage trains in heading into and out of sidings. The observations were made when the switch machines were used, and at the same points later by stopping the train before heading in or after heading out of the siding to simulate manual switch operation.

Table Showing Comparison of Train Operation

	Week, Dec. 1927	Week, Dec. 1928
No. of westbound passenger trains	64	65
No. of eastbound passenger trains	63	66
No. of through freight trains eastbound	36	43
Average time per through freight train from departure at Pana to arrival at Mattoon	2 hr. 14 min.	1 hr. 56 min.
Average gross tons per train	2,713	2,560
No. of through freight trains westbound	37	38
Average time per through freight train from departure at Mattoon to arrival at Pana	1 hr. 54 min.	1 hr. 48 min.
Average gross tons per train	1,656	1,751
No. of through freight trains on overtime—eastbound	16	12
No. of through freight trains on overtime—westbound	4	2
Average speed between Mattoon and Pana Through freight trains—eastbound	17.6 m.p.h.	20.3 m.p.h.
Through freight trains—westbound	20.7 m.p.h.	21.8 m.p.h.
Reduction in time per through freight train between Mattoon and Pana, (38.9 mi.)—eastbound	18 min.	
between Mattoon and Pana, (38.9 mi.)—westbound	6 min.	
On the above basis the reduction in time per 100 miles run—eastbound	46 min.	
100 miles run—westbound	15 min.	

A time-distance curve was made for each observation. the time noted being the time a given part of the train passed each permanent structure, such as a bridge, culvert, mile post, station, etc., which could be located accurately on the profile. When a train was to be headed into a siding these observations were plotted from about a mile before steam was shut off until the train was in the clear, and when a train was heading out, the observations were plotted from the instant the train started to move until normal speed was attained.

In order to determine what further benefits were realized in every-day operation of the switch machines, a daily memorandum was maintained by the dispatchers for a period of approximately a week, showing the time saved to freight trains by the ability to use the remote

control switches to advance through freight trains quickly from one siding to another, either preceding or following other trains. The daily average saving to these freight trains amounted to 53 min. between Terre Haute and Mattoon, and 58 min. between Mattoon and Pana. These savings, reduced to 100 miles of line, would amount, between Terre Haute and Mattoon, to 1 hr. 35 min. per day, and between Mattoon and Pana to 2 hr. 29 min. per day. Again it must be borne in mind that these figures are not in any sense a criterion of what might be expected to result from any remote-control switch installation. The savings shown obtain for this particular combination of grades adjacent to sidings, and for this particular volume and spacing of traffic.

Numerous Siding Movements

In order to show the number of trains using a siding, a study was made of the train operation for December, 1928, the section from Mattoon to Pana, 39 miles, being taken as a unit for comparison. During this month there were 287 eastbound and 297 westbound passenger trains, and 164 eastbound and 162 westbound through freight trains or a total of 912 trains in addition to the local freights. Twenty-one of the eastbound freight trains and 7 of the westbound freight trains were on overtime. The passing tracks were used, as shown in the table, a total of 423 times.

	Gays	Windsor	Middlesworth	Moulton	Tower Hill	Total
Passenger ..	14	57	85	14	36	206
Freight	32	19	58	39	69	217
Total	46	76	143	53	105	423

An analysis of train sheets for any period will not reveal all of the advantages which result from the use of remote-control switches. However, such an analysis was made of all movements between Mattoon and Pana, 39 miles, during a week in December, 1927, and a corresponding week in December, 1928. The comparison of the operation is shown in the table on the preceeding page.

Handling Perishables by Rail

Railroad Division, A. S. M. E., meets with refrigerating engineers at Penn State to discuss railroad transportation problems

THE American Society of Refrigerating Engineers held its sixteenth annual spring meeting at the Pennsylvania State College, State College, Pa., June 20 to 22, 1929, inclusive. Five sessions were held in the assembly room of Varsity Hall of the college, and from 60 to 80 mechanical and refrigerating engineers were present at each of these sessions. The two sessions held during the second day of the meeting were joint sessions of the A.S.R.E. and the Railroad Division of the American Society of Mechanical Engineers. Considering the fact that many railroad mechanical department officers were on their way to Los Angeles, Cal., to attend the annual convention of the Mechanical Division, A.R.A., these two sessions were well attended by railroad and railroad supply company representatives, who took an active part in the discussion of the six papers presented.

The morning session on Friday, June 21, was devoted to a symposium on the subject "Handling Perishables by Rail." A. W. Oakley, assistant manager technical department, Merchants Refrigerating Company, New York, presided at the morning session. The opening address was made by R. L. Sackett, dean of engineering, Pennsylvania State College. Dean Sackett spoke briefly on the increasing importance of the work of the refrigerating engineer to transportation. He stressed the need for further development in refrigeration to meet the rapidly increasing demands on the railroads for the efficient handling of perishable products from the grower to the consumer. In this he referred to the research and experimental work in heat transmission that was being done at the Penn State Engineering Experiment Station under the direction of A. J. Wood, head of the station, and president this year of the American Society of Refrigerating Engineers.

The first paper presented by the A.S.M.E. was an introduction to the symposium, and was prepared by J. W. Roberts, assistant vice-president, Pennsylvania, New York. Mr. Roberts, whose paper was read by Wm. H. Flottman, Jr., Pennsylvania, reviewed the growing demand for fresh fruits and vegetables the year round in the markets and what the railroads were doing to meet it. Our country, he said, outside of the tropics, is the only country in the world where manual workers can afford to eat fresh fruit and vegetables the year round. This is a triumph in mass production and mass distribution, as important as has been achieved with any of the products of industry. As a result of this achievement the attention of the average consumer is centered wholly upon making the proper choice of foods and not on the problem of getting enough. Mr. Roberts, in commenting on the tasks which the railroads were called upon to perform in feeding the population of a large city, referred to Philadelphia, Pa., and its immediate environments. In this district there is consumed annually nearly one billion dollars worth of food, of which meat has been the principal item. Every week on the average, he said, Philadelphia consumes about 180 carloads of potatoes, 72 carloads of cabbages, and 32 carloads of turnips, together with the meat of 8000 head of cattle, 10,000 sheep, 5,000 hogs, 720,000 dozen eggs, over a million pounds of butter and more than 160,000 lb. of cheese. Some $10,000,000 worth of fish is sold annually in Philadelphia. The bill for potatoes, onions and cabbages is over $15,000,000, and that for other fruits and vegetables over $25,000,000.

From the transportation viewpoint, Mr. Roberts stated, the significance of these figures is emphasized by the fact that practically seven-eighths of all the fruits and vegetables consumed in Philadelphia and its suburbs comes from entirely outside the territory immediately surrounding the city. The Pennsylvania in the last few years has invested upwards of $20,000,000 in new facilities just to cope with this problem. New and

completely modern terminals have just been finished in New York City, Philadelphia, Pittsburgh and Fort Wayne, Ind. On July 1 another new terminal owned and used jointly by the Pennsylvania, the Wabash and the Pere Marquette will be opened in Detroit. The New York terminal, he said, is the most extensive in the world devoted exclusively to perishable traffic, and the Philadelphia terminal ranks next.

Handling Perishables Into New York

Cars destined for the New York perishable terminal are ferried across the Hudson river on floats from Jersey City, N. J., piers. To secure the greatest expedition of movement, Mr. Roberts said, only one float is handled to a tug. There is room on the piers for displaying over 700 carloads of freight simultaneously, without duplication of space, and the floor room has recently been increased to meet the growth of the traffic. Eight auction rooms are provided for the convenience of the trade, and the bulk of the arriving produce is sold by this means, although some is disposed of by private negotiation.

Mr. Roberts pointed out that in 1928 57,000 cars of perishable freight were handled at this terminal, and that New York traffic in fresh fruits and vegetables jumped 50 per cent in the last three years. A supplementary facility in the New York district is the Manhattan produce yard, located on the New Jersey side of the Hudson river. It is the center, he said, of the juice-grape and watermelon trades of the entire New York district, and also handles other perishable produce at various seasons. One of the most interesting features he pointed out, is that it provides 3½ miles of display space on covered platforms adjacent to the tracks and here the buyers of juice-grapes and other products inspect the contents of the cars prior to auction. About 10,000 cars of California juice grapes have been sold at this yard each fall for the last few years.

On the Jersey City side, he went on to describe, there is another facility known as the apple export pier, from which are sent abroad about 12,000 carloads of export apples yearly. The Philadelphia terminal is located in the southern part of that city, at Oregon and Delaware avenues, on a 41-acre tract acquired for that purpose. It embraces three large buildings, each 800 feet in length by 110 ft. in width, on one of which a cold-storage warehouse having 2,000,000 cu. ft. of refrigerated space has been erected. Each of the buildings is served by four tracks, affording space for the simultaneous unloading of 2½ miles of freight cars. There is also provided, he said, a team-track delivery yard, containing 17 tracks with a combined capacity of 510 cars. Between the tracks, paved driveways 65 ft. in width have been constructed. Adjacent to the tracks, are covered inspection platforms on a level with the car floors.

A new Pittsburgh, Pa., terminal is now in use, Mr. Roberts said, although it has not been formally dedicated to the trade. The facilities consist of three yards and a large freight depot, with an auction and traffic house, all favorably located with reference to the established produce district of Pittsburgh. They provide for the present business of the city and its expansion for years to come, and represent an investment of about $5,000,000. The combined fruit and vegetable crop of the country, he said, is now worth about $1,500,000,000 annually.

Current Practice of Transit Refrigeration

The second page entitled "Current Practice of Transit Refrigeration," which was presented by the A.S.R.E., was prepared by Eugene F. McPike, manager, perishable freight service, Illinois Central. This paper was presented in abstract by David L. Fiske, secretary of the A.S.R.E., and an abstract of it will be published in an early issue of the *Railway Age*.

The third paper at the morning session was on the subject of "Governing Factors in Transportation of Perishable Commodities" and was presented by L. A. Hawkins, principal physiologist, Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C. The best conditions, Mr. Hawkins said, for the transportation of foodstuffs are similar to those for the holding of foodstuffs for the longest possible time in good condition in cold storage. While a number of factors are concerned in furnishing the best conditions for storage or for the keeping of produce in good condition in transit, by far the most important factor is the temperature at which the produce is held. The best temperature for keeping the produce, he said, is not necessarily the lowest temperature at which it can be held without freezing, as in many cases injury to the commodity may occur at temperatures well above the freezing point. The problem of furnishing the best conditions for perishable foodstuffs in transit is largely a problem of cooling it down to the proper carrying temperatures as quickly as possible by removing the heat, then furnishing sufficient refrigeration or heat to keep it at a relatively constant temperature en route to market. With non-living commodities, the amount of heat to be removed can be calculated approximately, Mr. Hawkins pointed out, from the specific heat of the commodity. With fruit and vegetables, however, which are usually shipped in a living condition, the problem is further complicated by the fact that they give off considerable heat due to the vital processes of the living organism. This heat, he said, comes from the breaking down of complex chemical compounds and varies with the temperatures at which the produce is held, and with the various types of fruits and vegetables. It must be determined experimentally for each commodity at each different temperature and no direct method for the measurement of this heat has been developed as yet. Mr. Hawkins showed that, it can be arrived at approximately by indirect methods, and he gave some data in his paper on the amount of vital heat given off by some fruits and vegetables at various temperatures.

Design of Railway Refrigeration Equipment

The afternoon session of the joint symposium was devoted to the general subject "Design of Railway Refrigeration Equipment." Frederick G. Grimshaw, works manager, Pennsylvania, Altoona, Pa., presided at this session. The first paper was entitled "Practice in Refrigerator Car Design," and was presented for the A. S. M. E. by E. A. Sweeley, mechanical superintendent, Fruit Growers Express Company, Alexandria, Va. Mr. Sweeley pointed out that the development of the design of refrigerator cars has been based upon the theory of ice refrigeration, tempered by service requirements and experience. Various notions and patents have specified different types and locations of cooling media, but practice has more or less crystalized in the iced car with end bunkers, free air circulation and suitable insulation. The condition of the food as loaded he said, its temperature and soundness, determine what its condition will be when unloaded, given proper icing on the trip. Boxes and crates should allow unobstructed circulation, and the partition between the car and ice compartment should be insulated.

Impetus for good construction he pointed out, began with the U. S. Railway Administration's recommendations of 1918, which related mainly to full-type basket

bunkers and to insulation, of which 2 in. was preferred for walls, 2½ in. for roof, 1 in. for bunkers. The three classes of cars commonly used are all-wood superstructure with all-steel underframes, steel superstructure with wood lining, sheathing, etc., and all-steel frame, and all-steel throughout. Only a few, he said, of the last variety are used, and these are in passenger service, indicating their lack of popularity.

Mr. Sweeley stated that cars with the wooden superstructure are common. Post and brace casting pockets are used in this construction, with caps so arranged as to provide joint bearing surfaces for the entire width and thickness, which is an important development in design necessitated by weaving of the car, and service shocks. Waterproofing the floors, he also pointed out, has been a problem in this work. Some shipments of green stuffs will melt as much as five tons of ice in the car itself, or 1,200 gal. of water. This is enough, he said, to make a pool 7 in. deep on the floor, much of which soaks into the floor itself. The prevention of absorption is, however, in an experimental stage. The roof is the front line of defense against heat in the summer and frost in the winter, and in its design account must be taken of keeping out cinders and dirt.

Heating, Mr. Sweeley stated, is required in certain sections of the country for a few months each year. Heaters are set on special grates in the bunkers or in the ice pans themselves, and the circulation they set up is the reverse of that resulting from the use of ice as the driving force. In heating service, he said, the danger to the product is from freezing, and is most liable to affect the bottom layer of goods. In summer, during cooling, danger to food is in spoilage which is most likely to take place in the top layer which gets the warmest air.

The Master Car System of Refrigerating Trains

The second paper of the afternoon session was presented for the A. S. R. E. by R. W. Waterfill, research engineer, Carrier Engineering Corporation, Newark, N. J. Mr. Waterfill, whose paper was on "Research Studies of Refrigerated Trains," described the "master car" system, the features of which include a train of refrigerator cars piped for brine circulation, cooled from a master car which contains a compressor, condenser, brine coolers, a gasoline motor, and an electric generator and motor, cooling tower, etc. This master car cools brine for 50 refrigerator cars when properly piped up. Mr. Waterfill estimated 40 tons as the load required to hold 35 deg. F. in a train of perishables.

According to Mr. Waterfill's description, the master car uses an internal combustion engine to generate current to drive a centrifugal refrigerator compressor, the details of which he illustrated with lantern slides. It involves also a 100-gal. brine tank for storage, a 900-gal. water tank to provide coolant for the condensers, and a motor for 10-hr. operation. The brake horsepower of the compressor he estimated at 65 hp. in the example he used to illustrate the master car systems, with 111 hp. required from the internal combustion engine. One hundred gallons of brine are circulated per minute.

The individual cars, Mr. Waterfill said, may have brine coils at the ends, or along the top. Two circuits are used, one complete in the train as a whole, the other complete in each car. This secondary system provides holding capacity, larger cooling surface and cuts down the amount of brine that must be circulated throughout the entire length of the train. The master car should preferably be placed in the middle of the train.

The fixed charge on this equipment, he estimated, would run $7,750 annually for amortization, interest, supplies for the train considered and the master car. The operating cost would run about $54.20 a day. For a transcontinental trip, he said, the total cost might thus be expected to amount to $2,700, as compared to $4,800 for ice.

Both Mr. Waterfill's paper and the last paper of the afternoon session, which was on the subject of "Recent Applications of Refrigeration for Precooling," were presented for the A. S. R. E. The final paper was prepared jointly by C. P. Goree, Jr., district engineer, Frick Company, Atlanta, Ga., and L. R. Graves, chief engineer, Edwards Ice Machine & Supply Company, Seattle, Wash. This paper stated briefly the need that has brought about the adoption of precooling, covered the earlier methods used and dealt in some detail with the present methods, the results accomplished and the construction of the present type of plant.

The paper referred to precooling conditions particularly in the southeast (citrus fruits) and the northwest (deciduous fruits). These two territories, the authors pointed out, have developed practices, beyond all the others. Southern Texas and California will doubtless follow along, but at present precooling is not generally practiced in those sections. Other sections of the country producing perishables, it was stated in the paper, are in most cases within easy reach of their market, and do not produce quantities large enough to require holding over in storage season. The apple crops, according to the paper, in Virginia, Pennsylvania and western New York reach large volumes, but here the product is close to permanent storage, remaining there until removed for later consumption.

Exhibit Includes Two Refrigerator Cars

An additional feature of these two sessions on transit refrigeration work was the exhibition of two refrigerator cars, one of which was the property of the Safety Refrigeration, Inc., refrigerated by the silica gel process, and the other owned by the Fruit Growers Express Company and refrigerated by ice. An exhibit of refrigerating equipment was also held in the mechanical laboratory of the college, which included a gas liquifier presented to the college by the Linde Air Products Company, an air filtration apparatus exhibited by the Armstrong Cork & Insulation Company, and air-conditioning equipment exhibited by the Carrier Engineering Corporation.

An informal dinner was held Friday evening, at which President A. J. Wood acted as toastmaster. The principal address was made by G. D. Ogden, general traffic manager, Pennsylvania, Philadelphia, Pa., whose remarks were confined largely to recent developments in railroad transportation. Other speakers on the program were Ralph D. Hetzel, president of the Pennsylvania State College, and A. R. Stevenson, Jr., of the General Electric Company.

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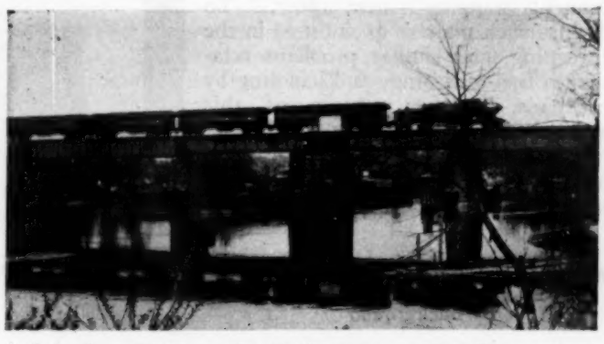
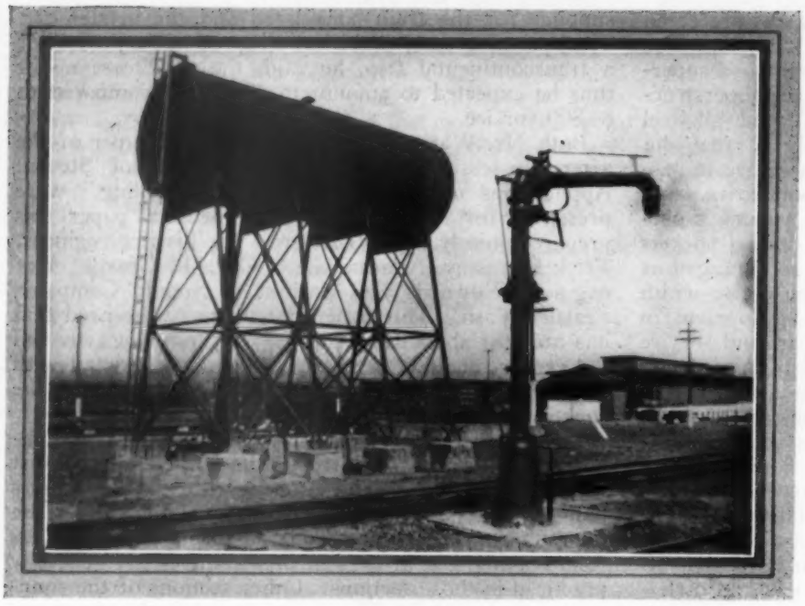


A Suburban Train on the Lackawanna at Lyndhurst, N. J.



A Fuel-Oil Column With an Elevated Supply Tank

Some practical hints for the storage and handling of oil for locomotive use

By H. L. Kauffman
Petroleum Consultant, Denver, Colo.

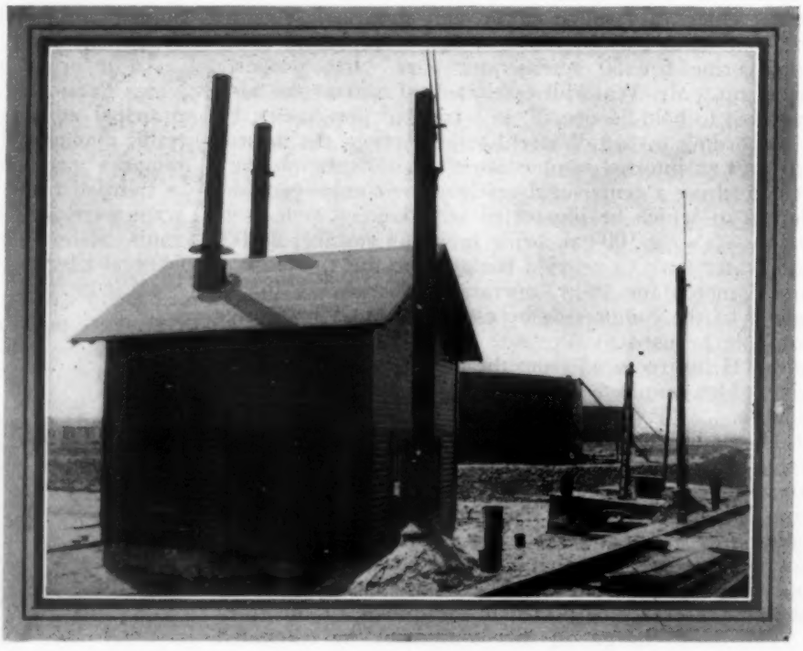
The Design of Fuel-Oil Stations Presents Many Problems

At present there are about sixty railroads (to the best of the writer's knowledge) burning oil as fuel, although some are burning oil only on parts of their lines. This number is increasing yearly. The problems involved in the storage and handling of this type of fuel are, therefore, a matter of considerable interest to a great many railway executives, as well as to railway construction and maintenance engineers.

The summer months are the time of the year when new fuel-oil storage or handling facilities should be built, or any changes in existing equipment should be made. Perhaps the railroad contemplates using this fuel for the first time, or a railroad already utilizing oil as fuel during the winter months, may desire to improve its facilities. The maintenance men may have found that their means for heating the fuel during winter were inadequate, and there is no wish to be "caught napping" next year. To discuss such matters as outlined in the foregoing, and similar problems relative to fuel-oil storage and handling by railroads, is the purpose of this article.

For storing large quantities of fuel oil, the use of above-ground cylindrical steel tanks prove most satisfactory. The grade of oil burned is usually "topped petroleum," which is the residue remaining after the more volatile constituents of crude petroleum have been removed by a process of distillation, leaving a heavy viscous product of high B.t.u. content for burning purposes.

While heretofore, it has been common practice for railroads to have overhead roadside tanks for delivering oil to locomotives, there is a decided tendency at the



An Oil Service Pump House With Two 55,000-bbl. Storage Tanks in the Background

present time to bury all such tanks—especially at terminals or stations where it is necessary to have storage close to shops or other buildings—because this practice tends to minimize the constant danger of fire. Here, it might well be mentioned that there is usually considerable spillage of oil around any oil station in spite of efforts to avoid it; consequently, where locomotives operate through the area there is always a danger of fire, even though the engine be oil-burning. Burying the tank, therefore, lessens the fire hazard.

Large Tanks Generally Vertical Type

The tanks employed for the storage of large quantities of fuel-oil are generally of the vertical type and are provided with either conical or dome-shaped roofs. Although concrete tankage may be utilized for storing the grade of fuel oil burned by railroads, such tanks are much more expensive than steel and require very careful construction.

The location of fuel-oil tankage is influenced largely by individual conditions, including the underwriters' rules, local or state fire ordinances or laws, etc. In general, tanks should be placed so that lines from the point of unloading will be as short as possible, since long lines—in addition to being costly—must be kept warm when handling heavy oil in cold weather. Further, the location must be so chosen that, if above-ground tanks are to be employed, there will be space around the tanks for dikes to retain the oil in case of rupture of the tank from any cause. Such dikes may be of earth, masonry or concrete.

Underwriters' Regulations

The regulations of the National Board of Fire Underwriters, with reference to the storage of fuel oil, can well be followed by railroads in order to keep the fire hazard at a minimum. Concerning the location and capacity of fuel-oil tanks for underground storage these regulations state:

Tanks shall preferably be located at least 50 ft. from important buildings. When this cannot be done, the limit of individual tank capacity permitted shall be dependent on the location of the tanks with respect to adjacent buildings as follows:

(a) Tanks may be of unlimited capacity if buried underneath or outside of buildings and at least 50 ft. from any buildings having a floor or pit lower than the top of the tank.

(b) Tanks may have a capacity up to 500,000 gal. if the tank is at least 40 ft. from any building having a floor or pit lower than the top of the tank.

(c) Tanks may have a capacity up to 200,000 gal. if tank is at least 30 ft. from any building having a floor or pit lower than the top of the tank.

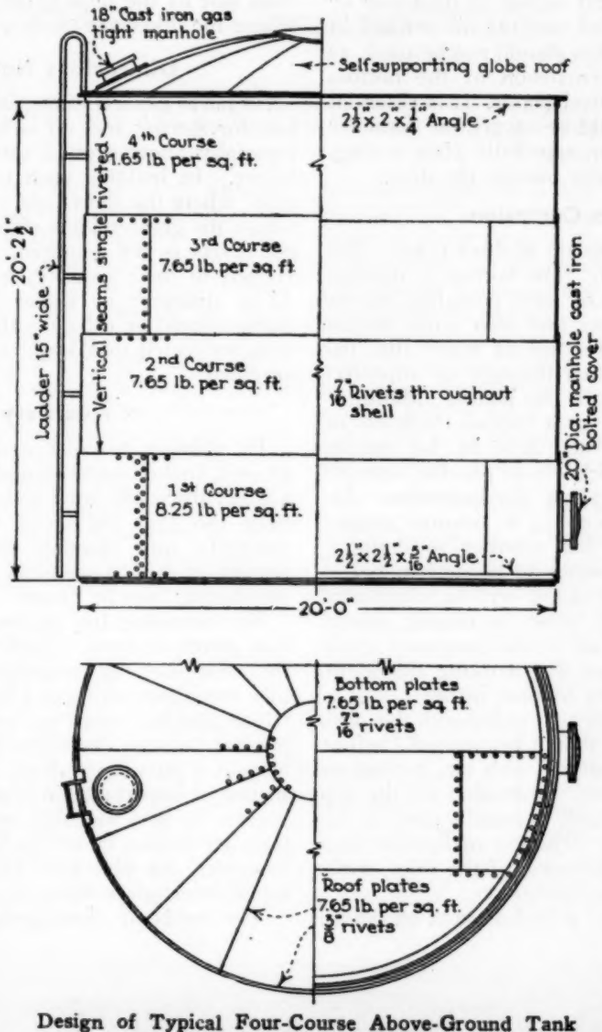
(d) Tanks may have a capacity up to 150,000 gal. if the tank is at least 25 ft. from any building having a floor or pit lower than the top of tank.

(e) Tanks may have a capacity up to 100,000 gal., if the tank is at least 20 ft. from any building having a floor or pit lower than the top of tank.

(f) Tanks may have a capacity up to $75,000 gal. if the tank is at least 10 ft. from any building having a floor or pit lower than the top of tank.

(g) If tank is within 10 ft. of any building and the top of tank is above the lowest floor or pit of the building, the tank shall not exceed a capacity of 50,000 gal. and must be metal entirely enclosed in concrete without an air space.

Incidentally, all tanks buried in the ground should be thoroughly anchored by concrete or other weights, it being good practice to have the weights equal to 60 per cent of the total buoyancy of the tank buried.


18" Cast iron gas tight manhole
Selfsupporting globe roof
2½ x 2 x ¼ Angle
4th Course 1.65 lb. per sq. ft.
3rd Course 7.65 lb. per sq. ft.
2nd Course 7.65 lb. per sq. ft.
1st Course 8.25 lb per sq. ft.
Vertical seams single riveted
Ladder 15" wide
20'-2½"
7/16" Rivets throughout shell
20" Dia. manhole cast iron bolted cover
2½ x 2½ x 5/16" Angle
20'-0"
Bottom plates 7.65 lb per sq. ft.
7/16" rivets
Roof plates 7.65 lb. per sq. ft.
5/8" rivets

Design of Typical Four-Course Above-Ground Tank with a Capacity of 1,000 bbl.

Concerning the location and capacity of fuel-oil tanks for above-ground storage these regulations state:

(a) The relation between the capacity of individual tanks and the permissible distance from other property is shown below:

Capacity of Tanks (Gallons)	Minimum Distance to the Line of Adjoining Property or Nearest Building (in feet)
750	5
1,100	10
3,000 or less	20
21,000 or less	25
31,000 or less	30
45,000 or less	40
64,000 or less	50
80,000 or less	60
128,000 or less	75
200,000 or less	85
266,000 or less	100
400,000 or less	150
666,000 or less	250
1,333,000 or less	300
2,666,000 or less	350

(b) For tanks of over 400,000 gal. capacity, a minimum distance of 175 ft. to adjoining property or nearest building may be permitted, provided that an approved type of extinguishing system is installed for the tank and covering other parts of the yard or system.

(c) For tanks permitted from 50 feet. and up to 175 feet. of a building or property line, the capacity may be increased 33 per cent if the tank is provided with an improved extinguishing system.

Reference can also well be made to these same regulations for valuable information on tank and dike design and construction, and on the piping system.

If possible, the location for an above-ground, fuel-oil tank should be selected where foundation work will not be difficult. While many tanks are placed on the ground without foundations of any kind, this should be done only where soil conditions are very good or the tanks are quite low, for a solid foundation is the first requisite in keeping fuel-oil tankage tight. In other words, it is of utmost importance in preparing the foundation that it be absolutely level and that it consist of solid material of a uniform character. Otherwise, the tank will settle unevenly with a resulting tendency to break the calking. This naturally causes leaks to develop in both the shell and bottom. Uneven settlement of the column will cause

the roof to buckle or sag and pull away from the shell exposing the contents to the elements. Partially filled grades should not be used, but in cases where a site on a side hill cannot be avoided, the filled soil should be well tamped. After tamping, the fill should be two or three inches higher than the solid portion. Further settlement after the tank has been filled will, therefore, tend to produce a more nearly level surface.

On good bearing soil no concrete need be used. However, the excavation should be carried to a firm hard bearing—the top soil and other loose material being replaced by some good filling material, the top 8 to 12 in. being clay or loam or a mixture of sand and clay. Soil that is either rocky or extremely moist, should be covered with a layer of oil sand several inches in thickness or the moist soil itself can be oiled and the oil worked in several inches by raking. Cinders should not be used, as their acid content promotes corrosion of the bottom which is constructed of light steel plates. It is essential to keep the grade (which should be of greater diameter than the tank) free from water, especially after testing. It is advisable to pump the water outside the dike.

Protection From Corrosion

Corrosion in fuel oil tanks occurs at three points: The bottom, the top ring and roof. The bottom is deteriorated by the corrosive action of salts contained in the soil upon which the tank rests and also from similar chemical action due to the presence of water that has settled out of the oil and leaked through an imperfect seam, forming a puddle beneath the plates. Manufacturers' standards usually call for a bottom thickness of ¼ in. on tanks of large size and 3/16 in. for smaller tanks. This is a sufficient thickness to provide strength and tightness, but does not allow for corrosion. Increasing the bottom thickness to ⅜ in. insures greater protection against corrosion, but whether so doing is economically advisable is a matter to be determined in the individual case. Soil corrosion will be eliminated entirely, or at least minimized, either by placing several inches of oil sand on the surface of the completed grade or by oiling the leveled surface and working the oil in, with rakes, to a depth of three to four inches.

In all cases, in order further to safeguard the tank bottom from deterioration, it should be painted (before being let down on the foundation) with tar, asphalt or some good rust-resisting paint. Corrosion of the top ring and roof of a fuel-oil tank is usually due to the action of condensed moisture. The use of heavier steel is often advisable to combat corrosion of the sides, while protective paint will lessen roof corrosion.

When it is necessary to erect a fuel-oil tank on piling, it is advisable to build a concrete slab to distribute the load over the piles with a concrete ring at the outer edge. Reinforced concrete slabs are also used where the soil conditions are not uniform. Here, it is well to mention that concrete slabs should always be covered with a cushion of sand and clay; otherwise, rivets may be sheared off and the calking sprung. When a tank is to be erected on a deep fill over good ground, it is good practice to use a concrete ring for containing the fill, which should be properly crowned so as to compress with the weight of a full tank.

The area to be provided within the dike depends largely upon the size of the tank; but it is good practice to have the capacity of the space within the dike greater than that of the tank by at least 50 per cent, especially where the dikes are made of earth.

Dimensions Now Standardized

So far as general dimensions are concerned, steel tankage for storing fuel oil is now practically standardized, especially above-ground tanks of 500 bbl. capacity or larger. In building such tanks, rivets may be "driven cold" where the sheets are ½ in. or less in thickness and where the greater joint efficiency obtained by the use of hot rivets is not required. Small tanks may be cold-riveted in their entirety, but tanks requiring rivets of ½-in. diameter or larger should be driven hot. All seams should be calked with a round-nosed tool, and the tank subjected to a water or oil test before it has been accepted.

Auxiliary Facilities

In addition to inlet and outlet connections, above-ground, fuel-oil tanks should be provided with flanges for a water draw-off, with an inlet and an outlet for heating lines (so that the more viscous oils can be readily pumped), and adequate roof vents. In addition, fire protection can be obtained by the use of either steam-smothering lines or "foam" lines.

For removing fuel oil from a tank, a "swing-suction" line should be used. Such a line, after passing through the tank shell, is connected inside the tank by means of a two-elbow swing to a length of pipe, the open end of which can be raised or lowered by means of a cable passing through the roof of the tank. By this arrangement it is possible to draw oil from any desired level—a matter of importance in case of stratification. The swing suction is also valuable when connections outside the tank are broken or valves become jammed since, in such instances, the pipe may be raised until it is above the liquid level—preventing any flow of oil from the tank.

The roofs of above-ground fuel-oil tanks should be

A Large Oil Storage Tank, Illustrating Typical Dike Construction

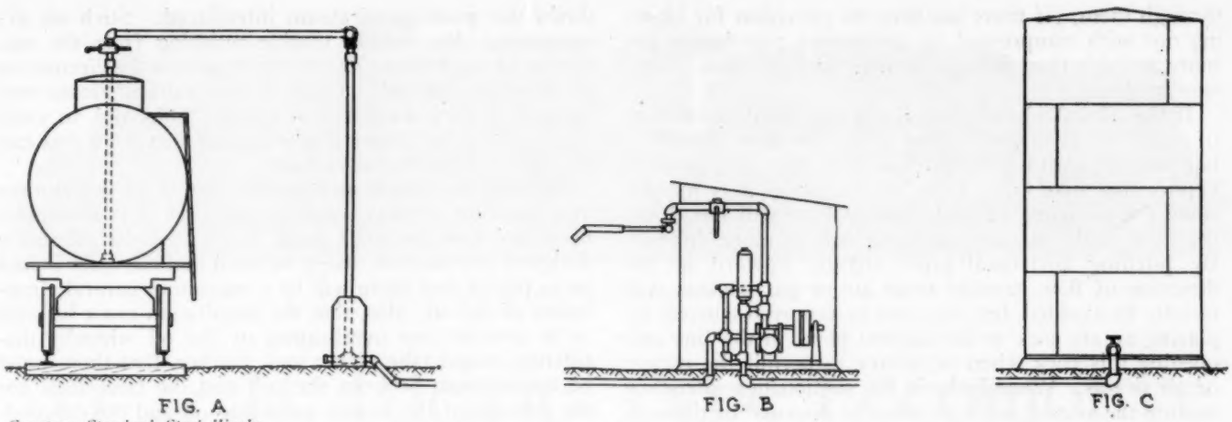


FIG. A FIG. B FIG. C

Courtesy Standard Steel Works

Layout of Facilities for Pumping from a Tank Car for Delivery to Fuel Oil Storage. The Pumping Equipment Shown at "B" May Also Be Used for Drawing Oil From Storage

provided with a vent to allow for the expansion and contraction of the oil, and the escape of vapors. The vents must be of sufficient capacity to allow the outlet or intake of air at the maximum rate of pumping to or from the tank, with additional allowance for a sudden change in the temperature of the air space above the oil—such as is caused by a shower on a hot day. The size of the vent should also be checked against the amount of steam that could be put into the tank with such steam lines, as are provided, wide open. To prevent any fire outside the tank from flashing back through the vents, the latter should be protected with screens not coarser than 40 meshes to the inch—the diameters of which are increased so that the areas of the actual openings are about 25 per cent greater than the areas of the vent pipes. Regardless of the material used, screens tend to corrode rapidly and clog; consequently, they should be frequently inspected and replaced.

When fuel-oil tanks are fitted with steam-smothering lines, such lines should be brought through the top ring of the tank and should have a goose-neck higher than the roof angle, so that oil can not flow into the steam pipes when the tank is completely filled. The lowest part of the branch before entering the main should be equipped with a valve for draining condensate.

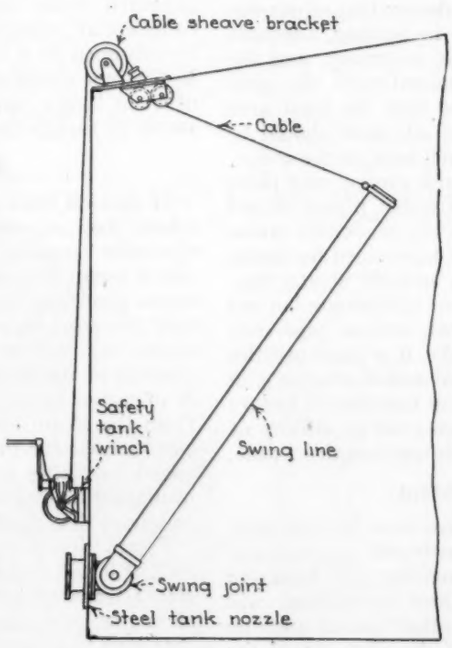
Some Suggestions on Piping

Pipes leading from a fuel-oil storage tank to the places where the tank is filled or emptied should be perfectly tight and should be of the shortest possible length. It is important that the number of turns and fittings in the line be at a minimum; for the fewer the number of pipe joints, the less is the danger of leakage, and the fewer the turns, the less is the friction and loss in pressure. Pumps delivering to or from fuel-oil tanks should be valved on both suction and discharge sides, while pumps delivering only to the tanks should be provided with a check valve to prevent the flow of oil from the tank back into the pump. When long lines run above ground and are left filled with oil, the heat from the sun will cause expansion of the oil, and if the valves at both ends of the line are closed, the oil will be forced through the joints—either at the collars or valves—until the pressure is released.

In general, pump suction lines should be of larger size than the high-pressure discharge lines. This is especially advisable when the oil is thick and viscous, since the suction head is limited. Best results will be obtained if the pump is so located that suction lines are very short and are laid with a minimum of bends and fittings.

Provisions for Cleaning Important

The formation of sediment in lines through which viscous fuel oils are pumped often presents numerous difficulties, unless provision was made when laying out the system for the ready removal of such deposits. A proper strainer in the suction line will catch most of this sediment, if a swing line is not used; while, if a swing line is employed, fairly clean oil will be obtained, as almost all the solid impurities will have settled to the bottom of the tank and can be removed through suitable clean-out openings.



Courtesy Oil Conservation Engineering Company

A Modern Type of Swing-Line Equipment for Use in Above-Ground Fuel-Oil Storage Tanks

Several expedients may be suggested to facilitate the removal of any sediment from pipe lines. If a fuel-oil piping system was laid out with no provision for blowing out long runs with compressed air or steam, the placing of occasional plugged openings in a line through which sediment or solidified oil can be removed by rodding or by the use of a wire is good practice. On a turn, the use of a "tee" (one end of which is plugged), has the advantage over an elbow in that it affords an opportunity to rod one branch of the line; while the use of a "cross," two ends of which are plugged, will give access to both branches. On fuel-oil pipe lines of relatively short length, which can be opened by running a wire

through them, (if there has been no provision for blowing out with compressed air or steam) pipe bends are more suitable than fittings because they give less resistance to flow.

If the oil to be handled contains any great percentage of constituents of low boiling point, the lines should be laid out to avoid pockets that will trap any gaseous vapors that may issue from the oil when it is heated, since the presence of such gas pockets will cut down the flow of the oil, and pumping will be more difficult. By pitching horizontal pipes slightly upward in the direction of flow, trouble from air or gas pockets will usually be avoided, but they can be removed entirely by placing an air cock at the highest point in the line and opening this cock when necessary to permit the escape of air or gas. When leaks in the suction line introduce air into the system, such air must be disposed of through air cocks or into the air-cushion standpipe.

Heating Fuel-Oil Tanks

In order to realize the advantages to be gained by the use of the heavier, lower-priced fuel oils, storage tanks should be provided with steam coils so that the oil may be heated to about 100 deg. F. to reduce its viscosity for pumping. For small, low tanks a flat coil over the entire bottom is all that is necessary. Such a coil should be supported on a wooden framework about six inches from the bottom and be arranged so that the piping will drain toward the outlet. If the coils were placed in direct contact with the bottom of the tank, much of the heat would be transferred thereto and radiated without heating the oil at all. For larger tanks, where the cost of heating the whole tank would be great, a coil around the suction pipe only will generally be sufficient. In the latter case, a box-type coil is most satisfactory.

For relatively tall fuel-oil tanks, the vertical type of coil is to be preferred. Such nests of coils should be installed in sections and should be placed at least six inches from the shell of the tank, so that there will be no excessive loss of heat by radiation and in order that there will be sufficient area for the descending oil stream at this point. To secure efficiency in heating, adequate circulation of the oil in the tank is necessary, and the desired circulation can not be obtained with the coils against the tank shell. To the end that the total area of the pipe will be presented to the oil, there should be at least a two-inch space between each turn of the coil.

Since rapid heating of oil in a tank cannot take place when coils are half-filled with air or water, piping should be so pitched that rapid drainage of the condensed steam will result. Waste of steam can be minimized by fitting the end of the outlet pipe with a suitable steam trap, thereby permitting the rapid escape of condensate but not allowing the escape of steam. When vertical pipe coils are placed in vertical cylindrical tanks, it is good practice to admit steam at the top of the coil and discharge it at the bottom, for the steam carries the candensate before it toward the trap, and that eliminates the possibility of condensate remaining in the coils for any length of time.

The Two-Coil System

Whatever the type of coil installed in a fuel-oil tank, the greatest economy will result if such coils are arranged in two separate units—one unit providing just sufficient surface so that the amount of heat introduced will balance that lost by radiation; the other having such an area as to raise the temperature of the contents of the tank to the desired point in a given length of time. When heating the oil in the tank, the second unit should be cut out as soon as the required oil temperature has been reached, since this is more economical than to throttle down the quantity of steam introduced. Such an arrangement also reduces trouble resulting from the collection of condensate, and better maintains the circulation of the oil in the tank. Either live or exhaust steam may be used in the coils placed in fuel-oil tanks and, in some cases, where hot water is a waste product even this can be used to economic advantage.

In order to obtain satisfactory results in the storage and handling of heavy viscous fuel oils, it is absolutely necessary that the coils used in the tank be efficiently designed and located. Keep in mind that the coils should be so placed that there will be a maximum natural circulation of the oil; also, that the installation must be such as to prevent any overheating of the oil whereby distillation would take place; and, further, that there must be ample room between the coil and the tank shell for the passage of the heated ascending oil and the descending cooled oil, which has been in contact with the outside tank walls. When more steam than usual, considering the temperature, is required to heat the oil in the tank, it is probable that the coils have been insulated by the formation of deposits that have settled out of the oil.

Jets May Be Used

With proper supervision, the discharge of the heating steam through nozzles directly into the oil is good practice; for, thereby, the oil is agitated thoroughly by the steam jets and is thus heated rapidly; and, further, the efficiency of the jets is not lessened by deposits as are steam coils. Often, steam jets are located in the bottom of the tank in addition to the coils, so that the cold oil can be brought up to temperature more rapidly than with the coils alone. After reaching the desired temperature, the jets are turned off and the heat maintained by the coils. Steam jets are used extensively for heating the fuel oil in locomotive tenders and has the advantage of assisting in the separation of suspended carbon from the oil when cracked fuel oils are used. However, care must be taken in using jets to avoid overheating the oil.

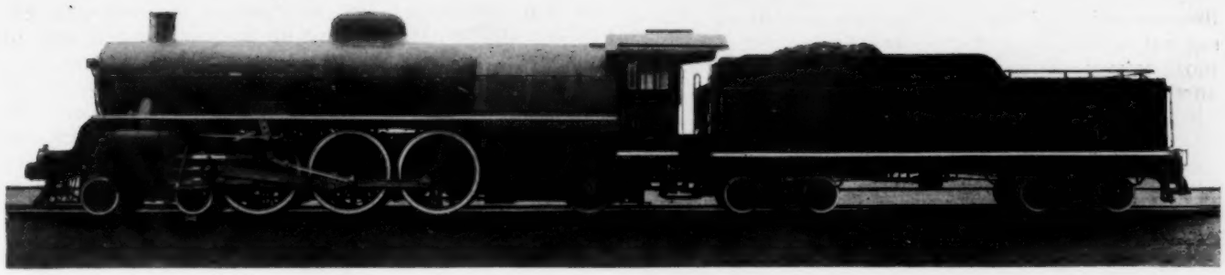
To conserve steam, small fuel-oil tanks are often insulated either by a hollow-tile jacket or with some commercial insulating material. Where much fuel oil is consumed by a railroad, especially at a terminal where low winter temperatures prevail, the insulating of tanks of even larger size will often save more than enough steam to justify the insulation.

Heating Oil Lines

If fuel-oil lines are very long, or are run in the open where they are exposed to cold weather, it is generally advisable (especially with the heavier grades of oil) to run a steam line parallel with the oil line. The oil and steam pipes can either be placed together within a buried split tile pipe, or in a concrete or wooden trench, or the steam line can be run inside of the oil pipe. The advantage of the latter method is that all the heat radiated is imparted to the oil and there is no direct radiation from the steam line to the outside air. Exhaust steam can be used for this purpose. Heat losses can be minimized by filling the trench with some commercial heat insulating material or can even be reduced by employing common, dry sand.

Steam piping, especially, should be given enough pitch so that it will drain readily, and should be provided with steam traps at intervals not exceeding 100 ft. These should be large enough to take care of any surge of water that may take place in the lines.

THE UINTAH RAILWAY resumed the operation of trains on July 1 after a suspension of four weeks, because of a rock slide near Baxter Pass, Colo.



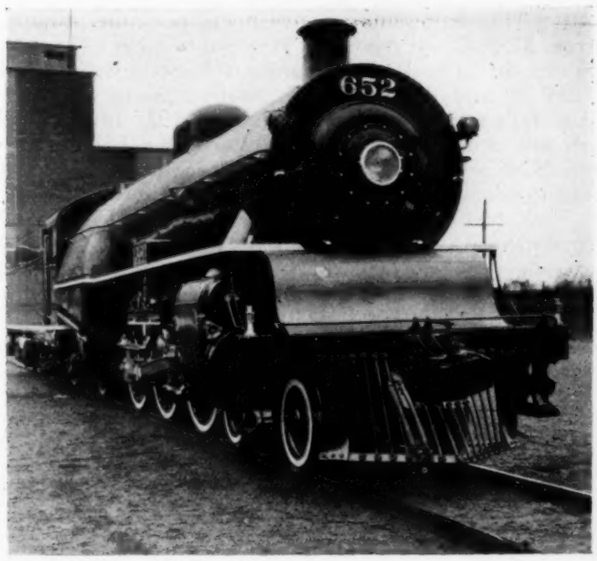
Delaware & Hudson 4-6-2 Type Locomotive Built in Many Respects After the British Pattern of Locomotive Design

D. & H. Pacific Type Locomotive

Built with streamline effect similar to British designs—Auxiliaries located below the boiler to secure low center of gravity

THE Delaware & Hudson recently placed in passenger service a 4-6-2 type locomotive, the general exterior appearance of which is similar in many respects to the general design of passenger locomotives used in de luxe train service in Great Britain. This locomotive was built at the Colonie, N. Y., shops of the railroad and is now being used in passenger-train service between Troy, N. Y., and Montreal. Que. It has a tractive force of 41,600 lb.; the drivers are 73 in. in diameter; the cylinders are 22 in. in diameter and have a stroke of 28 in. The boiler operates at a pressure of 260 lb. and it is hoped that tests with this locomotive will result in steam temperatures of 700 deg. F.

The total weight of the locomotive in working order is 283,300 lb., of which 185,300 lb. is carried on the drivers, 45,000 lb. on the engine truck and 53,000 lb. on the trailer truck. This weight on the drivers, divided by the tractive force, gives a factor of adhesion of 4.45. The engine has a light weight of 254,500 lb.



Front View of the D. & H. 4-6-2 Type Locomotive

As shown in the two illustrations, the boiler jacket covers all the pipe fittings and other appliances that usually appear on the locomotive of conventional design used in this country. The headlight is located in the center of the smokebox door. The headlight generator, air compressors and power reverse gear are located between the frames below the boiler. This location tends to lower the center of gravity of the locomotive, and it is reported to have considerably improved the riding qualities of the locomotive when traveling at high speed, especially in and out of curves. The whistle is located in the dome casing and an electric-operated gong is used for the bell which is located just to the rear of the pilot.

The tender is of the usual water-leg construction with a cast-steel underframe of Commonwealth design and has a capacity of 14 tons of coal and 11,000 gal. of water. It is carried on four-wheel trucks, provided with 33-in. diameter wheels having 6½-in. by 12-in. journals. Other dimensions, weights and proportions of this locomotive are shown in the table.

Table Showing the Principal Dimensions, Weights and Proportions of the Delaware & Hudson 4-6-2 Type Locomotive

Railroad	Delaware & Hudson
Type of locomotive	4-6-2
Builder	D. & H. (Colonie, N. Y., shops)
Service	Passenger
Cylinders, diameter and stroke	20 in. by 28 in.
Valve gear, type	Walschaert
Valves, piston type, size	12 in.
Maximum travel	7 in.
Outside lap	1-¾ in.
Exhaust clearance	3/16 in.
Lead in full gear	¼ in.
Weights in working order:	
On drivers	185,300 lb.
On front truck	45,000 lb.
On trailer truck	53,000 lb.
Total engine	283,300 lb.
Tender	160,500 lb.
Wheel bases:	
Driving	13 ft.
Total engine	34 ft. 10 in.
Total engine and tender	74 ft. 8 in.
Wheels, diameter outside tires:	
Driving	73 in.
Front truck	33 in.
Trailing truck	45 in.
Journals, diameter and length:	
Driving, main	11 in. by 13 in.
Driving, others	11 in. by 13 in.

Front truck	6½ in. by 12 in.
Trailing truck	9 in. by 14 in.
Boiler:	
Type	Wagon-top
Steam pressure	260 lb.
Fuel	Anthracite-Bituminous
Diameter, first ring, inside	74⅛ in.
Firebox, length and width	116-⅜ in. by 108 in.
Tubes, number and diameter	142 - 2¼ in.
Flues, number and diameter	30 - 5½ in.
Length over tube sheets	19 ft. 5⅜ in.
Grate area	87.09 sq. ft.
Heating surfaces:	
Total evaporative	3,162 sq. ft.
Superheating	1,495 sq. ft.
Combined evaporative and superheating	4,657 sq. ft.
Tender:	
Water capacity	11,000 gal.
Fuel capacity	14 tons
Wheels, diameter outside tires	33 in.
Journals, diameter and length	6½ in. by 12 in.
Rated tractive force	41,600 lb.
Weight proportions:	
Weight on drivers÷total weight engine, per cent	65.5
Weight on drivers÷tractive force	4.46
Boiler proportions:	
Tractive force÷comb. heat. surface	8.93
Tractive force × diam. drivers ÷ comb. heat. surface	65.2

British Railways in 1928

GROSS revenues equivalent to $1,001,887,870, operating expenses of $822,430,581 and net income of $199,670,559 were reported by the four amalgamated railway groups of Great Britain for the year ending December 31, 1928. These figures compare respectively with 1927 gross revenues of $1,046,007,766, operating expenses of $856,575,461 and net income of $207,570,064.

It will be seen from the foregoing that the net income decline amounted to only $7,899,505, despite the $44,119,896 drop in gross revenues. This was accomplished largely through operating expense reductions amounting to approximately $35,000,000. The net income figures are given in Table 1. They reveal that the net income of the London, Midland & Scottish dropped more than $5,000,000 from the 1927 figure while that of the Great Western fell $3,734,335. The London & North Eastern reported a slightly greater net income than in 1927, the increase amounting to $47,424, while the Southern reported an increase equivalent to $851,573.

Table I—Net Income of British Railways, 1928 Compared with 1927

	Net Income		Increase or Decrease
	1928	1927	
London, Midland & Scottish	$79,238,898	$84,303,065	—$5,064,167
London & North Eastern	54,922,686	54,875,262	47,424
Great Western	34,368,189	38,102,524	— 3,734,335
Southern	31,140,786	30,289,213	851,573
Total	$199,670,559	$207,570,064	—$7,899,505

The railway business of the four companies produced $883,846,297 of the $1,001,887,870 gross revenues in 1928. This compares with a 1927 railway gross of $924,962,110 and indicates that most of the decline in total gross revenues is attributable to a falling off in railway revenues. The distribution of revenues, expenses and net revenue among the various activities of the companies is given in Table 2. These figures indicate that losses resulted in 1928 from highway operations, collection and delivery services and canals. The loss on collection and delivery services was greatest and amounted to the equivalent of $6,459,972, as compared with a 1927 loss of $5,657,304 on these services. The Southern is the only one of the four roads which reported a profit on collection and delivery service and it likewise reported a slight profit for both highway and canal operations, the other two services which produced a net loss for the four companies combined.

Passenger train traffic during 1928 accounted for $387,444,207 of the $883,846,297 in gross revenue from railway operations, and freight traffic yielded a 1928 gross of $488,095,054. Miscellaneous revenues amounted to $8,307,037. These compare with respective 1927 figures of $395,003,932, $521,982,661 and $7,975,516.

January 1, 1928, was designated as the "appointed day" on which the Railway Rates Tribunal should bring into effect the new schedule of rates designed to produce for each company the standard return in accordance with the Railways Act, 1921. These new rates were operative throughout 1928, but failed by approximately $45,000,000 to produce the combined standard return fixed by the tribunal. In compliance with the law, therefore, a review of the rates has recently been opened. This situation was discussed in the *Railway Age* of April 27, page 966.

Of the total 1928 passenger train revenues of $387,444,207, the carriage of passengers yielded $302,485,206, a decline of about $7,000,000 from the previous year, despite the fact that more passengers were carried. This was caused by the many special fare concessions granted during the year as pointed out in the *Railway Age* of May 4, page 1028.

The decline in freight revenue from the 1927 figure is due mainly to the drop of about 20,000,000 long tons in the freight handled. The total long tons handled in 1928, excluding livestock, amounted to 372,541,897 whereas the comparable 1927 figure was 392,559,270. Livestock traffic also declined slightly from the previous year.

The total investment in road of the four companies at the close of the year amounted to the equivalent of $3,801,023,458 as against a 1927 figure of $3,787,534,-91. This represents an investment per mile, ranging from $159,327 on the Great Western to $266,184 on the Southern. The London, Midland & Scottish reported $223,139 and the London & North Eastern $179,265. All of these represent increases over 1927 investments per mile which were: Great Western, $158,655; Southern, $265,503; London, Midland & Scottish, $222,199 and London & North Eastern, $178,320.

The total investment in all railway facilities and equipment was $4,623,507,570 as against a 1927 railway investment of $4,609,478,249. Respective figures for total capital investment in all services were $5,455,727,-200 and $5,437,603,300.

Table II—Distribution of British Railway Receipts, Expenses and Net Receipts, 1928 Compared with 1927

	Gross Receipts		Expenses		Net Receipts	
	1928	1927	1928	1927	1928	1927
Railway	$883,846,297	$924,962,110	$707,124,205	$739,179,363	$176,722,092	$185,782,747
Road Transport	1,372,790	1,097,201	1,465,101	1,089,151	92,311*	8,050
Collection and Delivery	24,026,880	25,329,537	30,486,853	30,986,841	6,459,972*	5,657,304*
Steamboats	22,120,407	21,997,736	18,678,237	19,056,417	3,442,170	2,941,319
Canals	1,060,184	1,068,585	1,278,458	1,323,291	218,274*	254,706*
Docks, Harbors and Wharves	38,442,864	40,577,926	36,045,203	37,783,043	2,397,662	2,794,883
Hotels, Lunch Rooms and Dining Cars	30,850,052	30,788,169	27,190,778	26,983,876	3,659,274	3,804,293
Total	$1,001,887,870	$1,046,007,766	$822,430,581	$856,575,461	$179,457,289	$189,432,305

* Net Loss.

The Short Line Shipper's Interest In Consolidation

Will the Rail Motor Car Solve Short Line Problems?

The shipper may benefit most from independent operation of the short line rather than by its absorption

By Andrew Stevenson, Jr.

Strathcona Fellow in Transportation
Yale University

THE position of the short line in any scheme of consolidation, long a topic of discussion, has more recently become of immediate interest in the railroad world. Neglected in Professor William Z. Ripley's tentative consolidation groupings, the short line has attracted increasing attention, and a recent decision of the Interstate Commerce Commission made approval of the New York Central merger application conditional upon the inclusion of six tributary short lines in its system. The disposition of the shorter roads has been further emphasized in the subsequent applications of the Baltimore & Ohio and the Chesapeake & Ohio.

The short line occupies its place in consolidation programs by virtue of Section 5 of the Transportation Act of 1920, whose purpose has been interpreted as the preservation of "substantially the whole transportation system" in the interest of the public. The current assumption has been that this may be best effected by inclusion of the short lines in any contemplated merger.

It is worth while to raise the question as to the justification for this assumption, and to call attention to the fact that this preservation of the transportation system intact is advocated in the "public interest." This in turn becomes the "short line shipper's interest," and the problem is that of the short line shipper, quite distinct from that of the short line railroad itself. The question then is: Will preservation of the short line shipper's transportation facilities be best assured by inclusion of the short lines in large systems? The assumption that it will be is not fully warranted. Neither experience since the passage of the Act nor the prospect for the future assures the short line shipper that the preservation of his service is best secured by absorption of the short lines by large systems.

A study of abandoned mileage in the past shows that large road acquisition has been no guarantee of continued operation of a short line. Future acquisitions make short line abandonment more than a remote possibility. Of the 4,528 miles of line which the Interstate Commerce Commission had authorized for abandonment to July 1, 1928, under Paragraph 18 of Section 1 of the Transportation Act, 2,318 miles were the property of Class I railroads and 2,210 miles belonged to short line companies, as shown in Table I. Moreover, the majority of short line applications has come as a result of exhaustion of the natural resources which they were built to move. Only 20 per cent of the short line mileage abandoned has ceased operation through general unprofitableness, while 60 per cent of Class I mileage abandoned falls in the same category.

In addition to the actual miles abandoned, the denials of abandonment applications by the Commission have been largely confined to Class I roads, for of 27 applications denied (excluding those later granted) 22 were presented by this group of carriers.

Furthermore, the short lines have acquired and are now operating 539 miles of railroad for which abandonment had been authorized, while in only three instances, involving 74 miles of line, have the Class I carriers resumed operation. Of these 613 miles, 457 had been operated by Class I roads. Of the 74 miles re-operated by Class I lines, 44 are included in the Union Pacific operation of the Saratoga & Encampment.

But actual service afforded by the short line in the operation of lines which Class I roads have dropped is not fully indicated in the mere record of abandonments. In New England a group of roads, including the Belfast and Moosehead Lake, 33.07 miles; the St. Johnsbury & Lake Champlain, 96.20 miles; the Suncook Valley, 22.4 miles, and the Barre & Chelsea, 21.5 miles, all of which were cut off by the Boston & Maine in its general pro-

Table I—Abandonments Authorized by I. C. C.

Year	Class I and Subsidiaries Number	Class I and Subsidiaries Miles	Short Lines Number	Short Lines Miles	Total Number	Total Miles
1920 (2 mo.)	4	54	..	...	4	54
1921	14	214	17	458	31	671
1922	15	323	14	310	29	634
1923	12	354	8	104	20	458
1924	16	203	16	252	32	455
1925	31	331	22	392	53	722
1926	24	222	19	440	43	662
1927	35	538	17	215	52	753
1928 (6 mo.)	17	79	4	39	21	119
	168	2318	117	2210	285	4528

Table II—Reasons Given for Abandonment

Number of Applications	Class I Number	Class I Per Cent	Short Line Number	Short Line Per Cent	Total Number	Total Per Cent
Exhaustion of Timber	22	13	71	60	93	33
Exhaustion of Mines	34	20	14	12	48	17
Highway Competition	16	9	4	3	20	7
Railway Competition	16	9	6	5	22	8
New Construction	18	11	4	3	22	8
Plant Facilities	4	2	3	3	7	2
Unprofitableness	58	36	15	13	73	25
	168	100	117	100	285	100
Miles of Line						
Exhaustion of Timber	249	11	1064	48	1312	29
Exhaustion of Mines	327	14	266	12	593	13
Highway Competition	102	4	91	4	194	4
Railway Competition	110	5	274	12	385	8
New Construction	169	7	27	1	196	4
Plant Facilities	38	2	39	2	76	2
Unprofitableness	1323	57	489	22	1772	39
	2318	100	2210	100	4528	100

gram of abandonment of unprofitable branches, is now under local management and operation.

It has been felt that independent operation of these lines, which Class I carriers had abandoned, is feasible because of local community interest and a lower cost of operation. This same consideration of comparative costs of these types of operation should lead the short line shipper to obtain further information as to relative costs before he unhesitatingly adopts Class I operation as the solution of his need for continued service.

Increased Costs Under Consolidation

The subject of costs has been scantily treated in all discussions which have arisen to date. Possibly this is a result of the unknown nature of actual costs of some of the factors of operation, but it probably is due to a lack of accurate data. The general opinion has been that accounting, purchasing, and executive costs would be less, while wages, maintenance charges, and taxes would increase if the short line were absorbed by a Class I road. The degree with which emphasis has been laid upon these various items has led to the difference in final net estimates. The New York Central, in its argument against the absorption of the short lines, contended that the wage costs and increased maintenance charges would greatly outweigh any prospective economies. Counter argument stressed the savings to be effected and minimized the increased costs.

At best the topic of economies to be gained in any consolidation has been a matter of controversy. What then are the net economies of large road operation of short lines when new items of wages, maintenance and taxes are involved? It may be safely stated that the expected economies have been over rated. Short line accounting officers themselves have felt that anticipated savings are limited. Purchases are in such small quantities that economy here will be small, even under favorable conditions. Many short line executives now serve without compensation and greater economy in that direction is unlikely.

When routing of traffic and abstinence from highway and motor competition are concerned, the local community interest will be more diligent in attempts to support an independently managed road than a branch line. Community interest also may be shown in the taxes assessed on independent short lines. These seldom exceed $100 a mile. Two roads mentioned in the New York Central case, the Boyne City, Gaylord & Alpena, and the Chicago, Attica & Southern, average $127 and $52 per mile respectively. The New York & Pennsylvania pays only $24 per mile. This continued low taxation under Class I operation is improbable. When net revenue from operations is now at a minimum of a few dollars a mile, or even shows a deficit, taxes become an important item.

It is generally considered that the wage rates on short lines are lower than those of the Class I carriers, although the exact difference has not yet been ascertained since adequate data on short line wage rates have been unavailable. Some years ago the American Short Line Railroad Association attempted to survey all short lines, but reached the conclusion that operating conditions on many of the smaller roads varied so greatly that a proper measure of average short line rates of pay could not be obtained. The standard agreements also provide for different rates of pay for different classes of service, and many lines have special agreements with other than train service employees, which are applicable only to their own workers.

A preliminary report of a study of rates of pay on Class II carriers, for which group information is on file and which are sufficiently large to offer a similarity of operating conditions, shows that in 1927 the average hourly earnings for train service employees on 40 roads were approximately 50 per cent lower than the standard scales then in effect as a part of the Brotherhood agreements with Class I railroads.

The cases used appear representative of the Class II group, and apart from whatever merit or lack of merit there may be in the Class II scale itself, these wage rates are uniformly lower than Class I wage rates. When it is noted that only 2 of the 40 allow overtime at other than straight time basis, and that the above are computed earnings compared with rates and apart from any mileage payments, the contrast is more marked.

Table III—Average Hourly Earnings of Train Service Employees on Forty Class II Railroads, 1927

	Passenger		Local Freight	
	Cents per Hour	Per Cent of Standard	Cents per Hour	Per Cent of Standard
Eastern Territory				
Engineers	54.3	65.8	61.7	62.7
Firemen	45.3	74.0	47.3	65.6
Conductors	52.1	57.8	56.8	63.3
Trainmen	42.9	68.2	44.4	63.1
Southern Territory				
Engineers	66.7	81.3	56.2	57.3
Firemen	31.9	51.6	29.1	40.2
Conductors	45.2	50.3	49.8	55.5
Trainmen	23.9	37.8	26.1	37.0
Western Territory				
Engineers	64.3	83.6	70.3	76.3
Firemen	54.2	95.2	52.5	77.8
Conductors	62.7	74.8	64.8	77.6
Trainmen	50.2	85.5	49.9	76.3

There has arisen a fairly large body of decisions in connection with abandonments authorized in recent years by the Commission, and in cases which have been before the Supreme Court. It has been argued that the short line may operate at a loss, but as a part of a large road the loss would be compensated by gains on more profitable mileage. The history of these decisions clearly sets a limit to this argument. No road may be compelled to operate a branch line when such operation proves confiscatory. Shippers on unprofitable branches are not guaranteed continued operation of their line of road. If operation of many short lines is even now attended by loss, this increased wage cost, which forms a substantial part of operating expense, is sufficient alone to make operation of the same line of road as a branch line of a larger system well nigh impossible. The resultant loss to the carrier as a whole may be held to outweigh any gain to the local community through continued branch operation, and thus abandonment follows.

It seems certain, therefore, that the short line shipper should not be too hasty in accepting the assumption that the continued operation of the road that serves him is best assured by inclusion in a larger property. Large road operation in the past has not meant that a branch line was immune to abandonment. In fact, short lines are now frequently operating lines abandoned by large roads. Further acquisition of short line properties does not promise such economies as will permanently assure the shipper continued operation of a branch line. These economies have been greatly over estimated, and far from any question of whether the railroad or the public should receive the benefits of these dubious savings, the question really is: Who will bear the expense of these acquisitions? May it not be that the short line shipper's interest will best be served by the continuance of independently operated short lines, relying on the Commission, not to find a large road to absorb the short line, but rather to assure the short line of adequate rate divisions.

Railway Traffic Growing at a Diminishing Rate

Report to Interstate Commerce Commission shows increase in years 1900-1914 was 100 per cent, and in years 1914-1928 only 50 per cent

THE director of the Bureau of Statistics of the Interstate Commerce Commission, Dr. M. O. Lorenz, has made a report to the commission on the interesting subject of the growth and trend of steam railway traffic in the United States. This report, which covers both passenger and freight traffic for the entire period 1900 to 1928, shows that the annual increase of freight traffic from 1914 to 1928 was slightly less than from 1900 to 1914, and that, during the last 14 years was only one-half as great as in the 14 years immediately preceding the beginning of the war in Europe. A summary of the report follows:

The rates of growth of railway traffic have diminished. From 1900 to 1914, for example, freight ton-miles approximately doubled, while the ton-miles of 1928 were only about 50 per cent greater than those of the fiscal year 1914. Furthermore, the passenger traffic and the tons of freight have failed to maintain the same absolute amount of increase per annum in the second as compared with the first half of the period 1900-1928. Ton-miles of freight, however, show about the same annual addition in absolute amount from 1900-1914 (fiscal years) as from 1914 (fiscal) to the calendar year 1928, the annual addition in the first period having been 10.5 billion

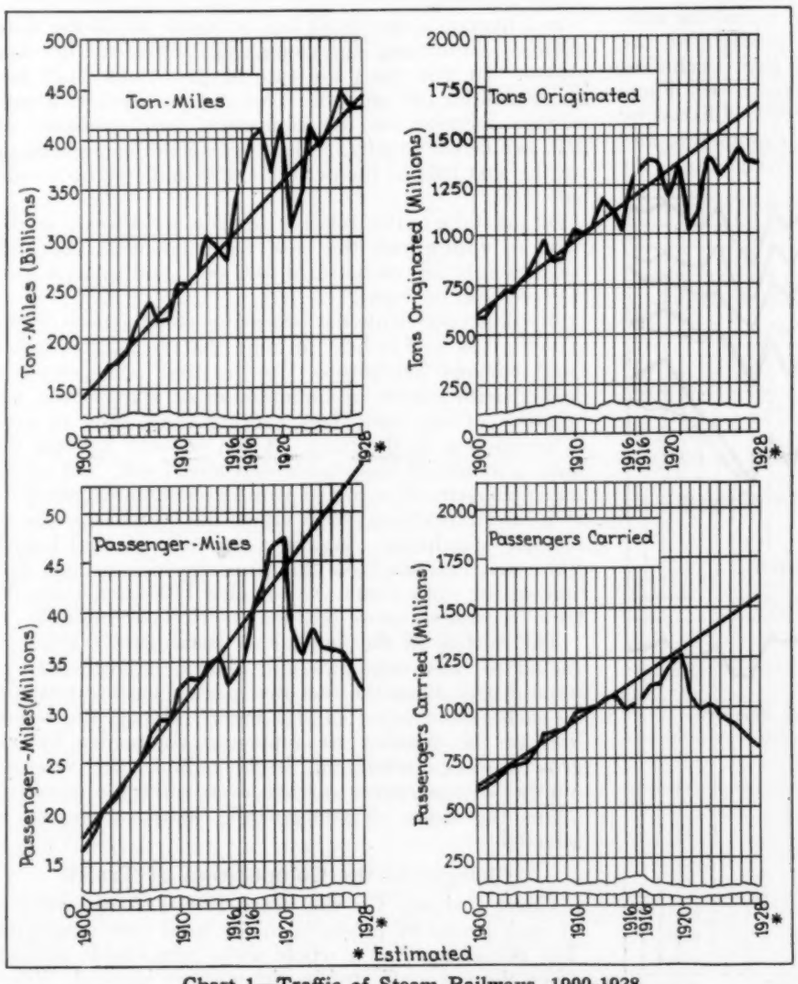


Chart 1—Traffic of Steam Railways, 1900-1928
(Trend line based on 1900-1915)

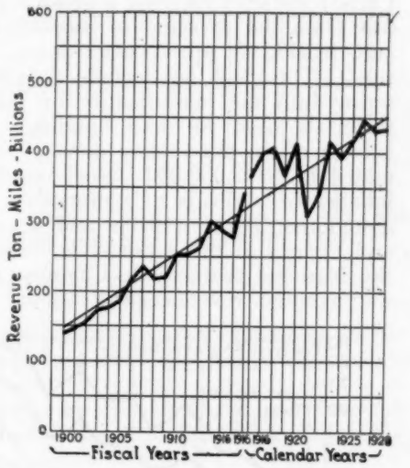


Chart 1a—Ton-Miles of Steam Railways, 1900-1928
(Trend line based on 1900-1928)

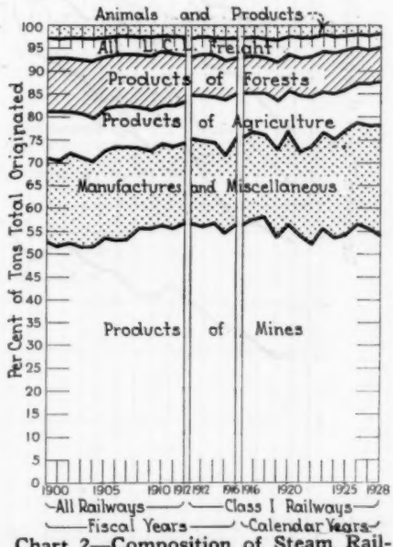


Chart 2—Composition of Steam Railway Freight Traffic, 1900-1928

ton-miles and in the second 10.2 billions. These facts are brought out in Chart 1 in which straight trend lines are shown fitted to the data for the years 1900-1915 and projected forward to 1928 without regard to the actual data after 1915. In the case of ton-miles the actual 1928 traffic is close to the trend line, but for the other three units there is a distinct falling away.

It is not the purpose here to discuss the probable future effect of various forces affecting the volume of railway traffic. It is left to others to speculate on the future effect on railways of motor vehicles, improved waterways, air-planes, transmission of electrical energy as supplanting the hauling of coal, centralization or dispersion of industries, further supplanting of lumber by cement, exhaustion of petroleum supplies, relative decline of agriculture and growth of manufactures, etc. It is not safe to predict the future solely by the past because new forces come into action. The development of the motor vehicle was such a force, the effect of which on railroad traffic was not appreciated fully in 1915.

The inroads upon passenger traffic and short haul freight traffic have been offset in part by the new freight traffic created by the automobile industry. In 1928, the Class I railways received a gross revenue of $194,111,-044 from the carrying of passenger automobiles and auto trucks, set up, knocked down, or parts, including tires. This does not include freight on materials entering into the manufacture of such vehicles, or on materials used in road building, stimulated by the growth of the automotive industry, which may be estimated at $322,000,000, based on the product of the number of carloads of automotive freight (excluding automotive vehicles, parts and tires) given in "Facts and Figures of the Automobile Industry," published by the National Automobile Chamber of Commerce, and the average revenue per carload derived from the quarterly reports of freight commodity statistics. There is, then, a total of 516 million dollars of railroad freight revenue resulting from the growth of the automotive industry. If the passenger-miles had grown according to the straight line progression shown on Chart 1, the passenger revenue of 1928 would have been 1,516 millions of dollars as compared with estimated actual revenue of 904 millions, a decline of 612 millions. Thus, the net reduction in *gross* revenue from these factors is $96,000,000 per annum. This takes no account of the revenues from bus operations controlled by railroads and not included in passenger revenue, nor in the loss of freight revenue on account of motor truck competition. It may also be noted that the gain in revenue from automotive freight and the loss in passenger revenue are not distributed among the carriers proportionately.

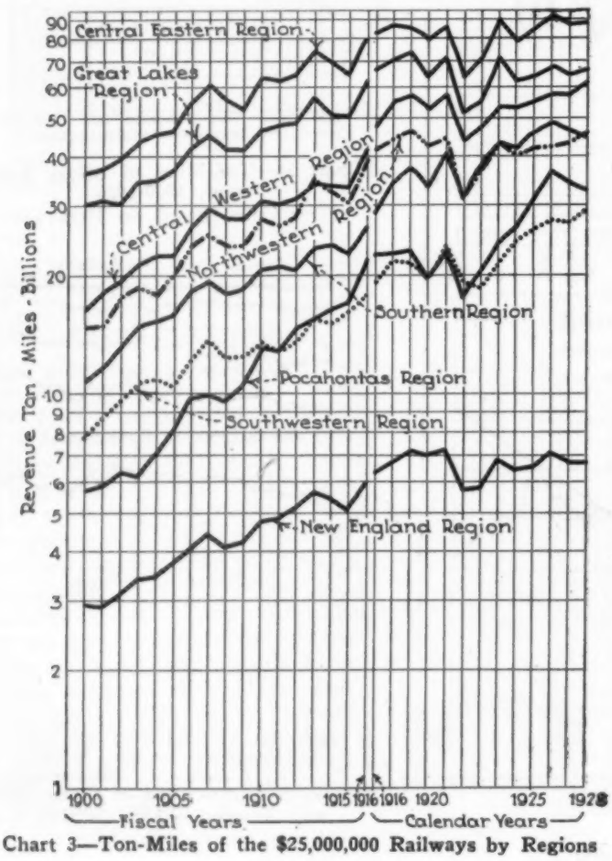


Chart 3—Ton-Miles of the $25,000,000 Railways by Regions

Table I—All Steam Railways

Year or period	Products of agriculture Per Cent	Animals and products Per Cent	Products of mines Per Cent	Products of forests Per Cent	Manufactures and miscellaneous Per Cent
1900—1902	100	100	100	100	100
1910	136.1	126.3	181.7	169.2	161.5
1911	144.7	144.7	176.1	158.9	155.8
1912	152.9	151.5	184.3	146.1	158.7
1927	190.6	156.3	240.8	169.6	263.8

Table II—Class I Railways

Year or period	Products of agriculture Per Cent	Animals and products Per Cent	Products of mines Per Cent	Products of forests Per Cent	Manufactures and miscellaneous Per Cent
1911—1913	100	100	100	100	100
1927	122.0	104.4	131.4	116.8	161.2
1928	126.9	102.9	128.1	113.7	171.6

In Chart 1-A the trend line is based on all the data without eliminating the abnormal traffic of the war period. In this chart the rate of growth is 10.35 billion ton-miles per annum. This is equivalent to a percentage increase on the compound interest basis, of 3.91 per cent annually. The corresponding percentage for the first half of the period is 4.98 and for the second half 2.89.

In the tables, the relative figures are shown in the form of ratios with the base years taken as 100 and, consequently, an increase of 100 per cent appears as a ratio of 200 per cent.

In connection with the preceding statement of traffic growth, it is well to bear in mind that the figures suffer from various infirmities. In the first place, we are dealing with a mass of commodities of many kinds, the quantity of any one class varying from year to year in proportion to the total. A ton of sand has not the same commercial importance as a ton of silk. To a railway management, a ton of iron has not the significance of a ton of feathers, from either the cost of service or revenue standpoint. Again, a ton-mile of coal hauled 300 miles does not have the same significance as a ton-mile of the same commodity hauled 150 miles, since the latter represents more terminal service per ton-mile.

The decline in the number of passengers carried, as shown in these statistics and charts, is overstated in some degree from the fact that passengers are reported by each railway that carries them. Hence, the reduction in the number of reporting companies by the growth of consolidation, itself reduces the reported number of passengers carried, even when the travel remains the same. Passenger-mile statistics are not so affected.

Changes in the Composition of Traffic

Chart 2 shows for the years 1900-1928 the relation of each group of products to the total tons originated. The percentages as a whole show remarkable stability when the years affected by the war are ignored. There is a tendency for agricultural, livestock, and forest products to become less important, and for manufacture to

become more important. The percentage for l. c. l. traffic is diminishing. In this chart, the most conspicuous feature is the narrowing of the band for products of forests and the widening of the band for manufactures and miscellaneous. Table 1 shows the increase in carload tonnage originated on all steam railways, by groups of commodities for selected years, compared with the tonnage of the three-year (fiscal) period, 1900-1902, compared with a base period for each group independently. Figures for 1927 were compiled specially to cover all roads. The greatest increase for the whole period is for manufactures and miscellaneous, with the other groups in the following order: Mines, agriculture, forests, animals.

If the traffic of the three years, 1911-1913, be taken as 100 per cent, the percentages for 1927 and 1928 are as shown in Table II. The growth of manufactures is again the conspicuous feature, and the order for the other groups is again, mines, agriculture, forests, animals.

The aggregate number of tons of a particular class of freight reported as originated by railways cannot be expected to check with the number of tons produced in the United States according to other statistical sources. However, over a period of years large changes in volume of production will be reflected in the volume of freight traffic, as measured by ton-miles. This appears from the comparison made in Table III of an index of ton-miles with an index of industrial production, both based on the annual average of the three-year period, ended June 30, 1913. Allowing for the fact that the ton-miles include other than industrial products, the correspondence is as close as one could expect.

Table III—Comparison of Freight Ton-Miles with Industrial Production

(Average, years ended June 30, 1911, 1912, and 1913 taken as 100).

Year ended	Index of revenue ton-miles	Index of industrial production
June 30, 1911	92.9	89.3
1912	96.7	96.3
1913	110.4	114.4
1914	105.7	102.1
1915	101.4	91.9
1916	125.7	132.2
Dec. 31, 1916	134.0	139.4
1917	145.8	137.6
1918	149.6	133.6
1919	134.4	123.6
1920	151.4	129.7
1921	113.3	98.6
1922	125.3	128.4
1923	152.4	155.6
1924	143.5	144.5
1925	152.8	160.3
1926	163.8	165.6
1927	158.1	161.4
1928	159.7	166.3

* From data in bulletin published by the Standard Statistics Company, Inc., of New York, March, 1929, p. 76, modified to conform to the fiscal year base used for ton-miles.

Railway Traffic in Relation to Population

The railways moved one ton 1,860 miles for every person in the United States in 1900, while in 1928 a ton was moved 3,635 miles for every person. On an average, every person traveled 211 miles by railway in 1900. This figure rose to 361 in 1914 and 447 in 1919 but has fallen again to 264 in 1928, approximately the average for 1904. The per capita ton-miles increased 90.2 per cent from the base period 1900 1902 to 1928. For per capita passenger-miles the corresponding percentage is 16.3. But with the period, 1911-1913 (fiscal years) taken as a base, the per capita ton-miles increased only 26.6 per cent, and the per capita passenger-miles declined 25.4 per cent. This is shown in detail in Table IV.

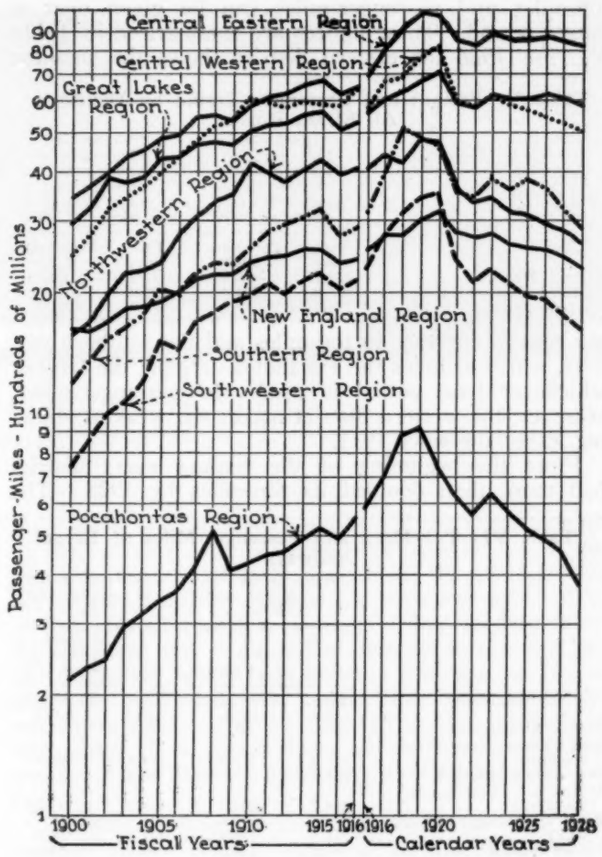


Chart 4—Passenger-Miles of the $25,000,000 Railways by Regions

The statistics were not separated according to districts prior to 1911, but the ten groups used in the earlier years have, after some necessary adjustments, been consolidated into districts so that a comparison of

Table IV—Comparison of Freight Traffic and Passenger Traffic of Steam Railways with Population, 1900-1928

Year ended	Population Continental United States (Midyear)	Revenue ton-miles per capita: Number	Ratio to 1900–1902	Ratio to 1911–1913	Passenger-miles per capita: Number	Ratio to 1900–1902	Ratio to 1911–1913
June 30:			%	%		%	%
1900	76,129,408	1,860	97.3	....	211	93.0	....
1901	77,747,402	1,892	99.0	....	223	98.2	....
1902	79,365,396	1,982	103.7	....	248	109.3	....
1903	80,983,390	2,139	111.9	....	258	113.7	....
1904	82,601,384	2,113	110.6	....	265	116.7	....
1905	84,219,378	2,214	115.9	....	283	124.7	....
1906	85,837,372	2,515	131.6	....	293	129.1	....
1907	87,445,366	2,706	141.6	....	317	139.6	....
1908	89,073,360	2,452	128.3	....	327	144.1	....
1909	90,691,354	2,413	126.3	....	321	141.4	....
1910	92,267,080	2,764	144.6	....	350	154.2	....
1911	93,682,189	2,709	141.8	94.4	354	155.9	100.0
1912	95,097,298	2,777	145.3	96.7	348	153.3	98.3
1913	96,512,407	3,126	163.6	108.9	359	158.1	101.4
1914	97,927,516	2,947	154.2	102.6	361	159.0	102.0
1915	99,342,625	2,790	146.0	97.2	327	144.1	92.4
1916	100,757,735	3,409	178.4	118.7	341	150.2	96.3
Dec. 31:							
1917	102,172,845	3,898	204.0	135.8	392	172.7	110.7
1918	103,587,955	3,946	206.5	137.4	417	183.7	117.8
1919	105,003,065	3,497	183.0	121.8	447	196.9	126.3
1920	106,421,621	3,887	203.4	135.4	445	196.0	125.7
1921	108,444,777	2,854	149.3	99.4	348	153.3	98.3
1922	109,893,003	3,114	163.0	108.5	326	143.6	92.1
1923	111,693,474	3,727	195.0	129.8	343	151.1	96.9
1924	113,727,432	3,446	180.3	120.0	320	141.0	90.4
1925	115,378,094	3,618	189.3	126.0	313	137.9	88.4
1926	117,136,000	3,820	199.9	133.1	305	134.4	86.2
1927	118,628,000	3,642	190.6	126.9	285	125.6	80.5
1928*	120,015,000	3,635	190.2	126.6	264	116.3	74.6

* Estimated.

ton-miles and passenger-miles can be given over a longer period. These figures are summarized in Table V. For 1928 the eastern district shows the smallest

Table V—Freight and Passenger Traffic by Districts: All Steam Roads

District	Ratio of 1928 traffic to average traffic of three fiscal years 1900-1902 taken as 100		Ratio of 1928 traffic to average traffic of three fiscal years 1911-1913 taken as 100	
	Ton-miles	Passenger-miles	Ton-miles	Passenger-miles
Eastern District	230.5	178.6	131.6	109.3
Southern District	436.0	204.3	207.0	93.7
Western District	335.1	171.2	179.9	76.2

per cent of increase in ton-miles and the southern district, which includes the Pocahontas region, the largest, whichever base period is used. In passenger-miles, however, the western district makes the weakest showing, especially since 1911.

From the beginning of the century every district had more than doubled its ton-miles by 1928. The growth was relatively more rapid in the south and west than in the east. When the comparison is between 1928 and the 1911-1913 base, the southern district more than doubled its traffic, and in the western district the freight traffic grew more rapidly, relatively, than that of the eastern district.

Passenger-miles in 1928 were more than double the 1900-1902 base average only in the southern district. From the 1911-1913 base to 1928, the decline of passenger travel is especially marked in the western district. In the eastern district passenger miles increased from 1911-1913 to 1928. But the recent tendency in this district is also downward.

The detailed tables showing traffic changes for individual systems, each year 1900 to 1928, are not reproduced because of their bulk. The summary of these changes, shown in Table VI, may be of interest, however. The traffic figures given for each year cover all of the companies represented in each of the systems in 1928, even though formerly they may have been operated separately.

Table VI—Ton-Miles and Passenger-Miles of Large Railways

Name of railway	Ratio of traffic of calendar year 1928 to average of three fiscal years 1900-1902 (base period 100)		Ratio of traffic of calendar year 1928 to average of three fiscal years 1911-1913 (base period 100)	
	Ton-miles	Passenger-miles	Ton-miles	Passenger-miles
Boston & Maine	182.6	97.7	110.6	71.4
New York, New Haven & Hartford	278.2	169.9	149.8	105.6
Delaware & Hudson	269.9	113.8	120.9	72.3
Delaware, Lackawanna & Western	206.2	204.3	116.1	119.8
Erie (including Chicago & Erie)	211.5	125.7	147.4	96.1
Lehigh Valley	140.3	134.2	99.6	89.6
Michigan Central	223.1	282.2	139.6	139.3
New York Central	194.2	207.6	115.0	126.2
New York, Chicago & St. Louis	241.7	42.4	153.4	37.5
Pere Marquette	470.0	83.8	181.9	43.0
Pittsburgh & Lake Erie	229.4	261.2	122.7	118.1
Wabash	281.3	87.5	163.6	65.4
Baltimore & Ohio	226.8	119.3	141.6	85.2
Central R. R. of New Jersey	213.1	223.5	123.8	133.1
Chicago & Eastern Illinois	222.2	218.6	99.7	85.3
Cleveland, Cincinnati, Chicago & St. Louis	371.6	150.0	188.1	95.1
Elgin, Joliet & Eastern	....	....	....	....
Long Island	398.9	800.3	120.0	336.0
Pennsylvania	207.6	206.6	116.2	115.3
Reading Co.	233.0	111.3	125.3	79.2
Chesapeake & Ohio	593.3	147.6	280.0	81.0
Norfolk & Western	511.3	183.8	190.1	81.7
Atlantic Coast Line	399.1	252.3	176.1	100.1
Central of Georgia	355.5	168.4	194.9	70.1
Illinois Central *	343.8	213.3	195.1	107.6
Louisville & Nashville	445.6	213.3	245.6	100.3
Seaboard Air Line	497.5	281.0	222.7	96.9
Southern	335.8	186.9	188.7	89.7
Chicago & North Western	213.0	172.5	155.7	84.8
Chicago, Milwaukee, St. Paul & Pacific	356.4	171.2	173.2	71.7
Chicago, St. Paul, Minneapolis & Omaha	210.6	115.5	143.9	55.3
Great Northern	370.2	154.5	157.9	63.1
Minneapolis, St. Paul & Sault Ste. Marie	321.3	159.5	138.0	57.9
Northern Pacific	257.8	103.5	131.4	50.3
Oregon-Washington R. R. & Navigation Co.	408.9	156.4	175.3	52.2
Atchison, Topeka & Santa Fe	345.7	238.4	198.1	98.0
Chicago & Alton	255.8	135.5	123.2	83.3
Chicago, Burlington & Quincy	331.1	135.6	164.5	64.2
Chicago, Rock Island & Pacific	369.3	162.0	187.6	69.4
Denver & Rio Grande Western	220.3	90.0	143.4	54.2
Oregon Short Line	312.6	170.4	174.2	66.0
Southern Pacific	302.9	184.4	223.6	100.9
Union Pacific	502.6	235.4	244.6	95.1
Gulf, Colorado & Santa Fe	471.9	142.6	243.7	56.2
Missouri-Kansas-Texas (including Missouri-Kansas-Texas of Texas)	278.5	172.5	211.0	52.9
Missouri Pacific	347.3	165.9	208.2	90.2
St. Louis-San Francisco	364.5	216.0	176.4	71.6
Texas & New Orleans	221.6	204.5	171.3	85.3
Texas & Pacific	531.4	187.1	336.6	104.0

* Including Yazoo & Mississippi Valley.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended July 6, which included a holiday, totaled 908,832 cars, an increase of 57,885 cars as compared with the corresponding week of last year and of 69,747 cars as compared with 1927. All classes of commodities showed increases as compared with the loading in the corresponding week of both years, except livestock, which showed a decrease as compared with both years. All districts except the Southern and Southwestern reported increases as compared with 1928, while all except the Pocahontas and Southern showed increases as compared with 1927. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, July 6, 1929

Districts	1929	1928	1927
Eastern	201,097	192,411	186,337
Allegheny	194,355	172,379	173,194
Pocahontas	45,931	44,204	46,473
Southern	118,332	118,925	126,051
Northwestern	142,168	126,301	129,414
Central Western	136,399	125,233	116,083
Southwestern	70,550	71,494	61,533
Total Western Districts	349,117	323,028	307,030
Total All Roads	908,832	850,947	839,085
Commodities			
Grain and Grain Products	52,493	43,289	36,273
Livestock	20,275	20,526	23,141
Coal	122,604	114,971	115,168
Coke	11,644	9,058	9,567
Forest Products	50,061	47,443	48,864
Ore	66,789	57,018	57,163
Merchandise L. C. L.	224,304	221,508	220,413
Miscellaneous	360,662	337,134	328,496
July 6	908,832	850,947	839,085
June 29	1,095,724	1,003,699	1,021,438
June 22	1,069,046	987,369	1,018,060
June 15	1,069,089	1,002,813	1,016,479
June 8	1,054,792	995,570	1,028,367
Cumulative total, 27 weeks	26,505,770	25,312,720	26,360,125

The freight car surplus for the week ended June 30 averaged 217,657 cars, including 116,657 box cars, 55,150 coal cars, 26,200 stock and 13,658 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended July 6 totaled 63,616 cars, a decrease of 10,605 cars from the previous week and an increase of 3,393 cars over the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
July 6, 1929	63,616	36,208
June 29, 1929	74,221	40,449
June 22, 1929	75,354	39,905
July 7, 1928	60,223	33,258
Cumulative Totals for Canada		
July 6, 1929	1,770,154	1,141,610
July 7, 1928	1,724,121	1,057,408
July 9, 1927	1,630,677	1,028,776

Forty or Fifty Ton Box Cars?

Opinion is divided as to restricting all box cars to the smaller capacity

IS the 50-ton box car uneconomical? Should the capacity of standard box cars be restricted to 40 tons? These questions have given rise to many conflicting opinions of late. In an endeavor to ascertain the trend of thought, the executives of 25 of the largest railways were asked to express their ideas on the subject. A study of their replies shows that 11 of them favor the limiting of box car capacity to 40 tons while 12 are just as positive that this should not be done and two state that while they can get along quite well with 40-ton cars, they are not in favor of any restriction in car capacity.

In order that the various arguments advanced by these men may be judged fairly, it is necessary to understand the developments of the past six years in the way of car loading. In the spring of 1923, the American Railway Association set a number of goals for operating achievements, and, since that date, most of these have been reached or exceeded. Among these objectives was the following:

"That all interested be impressed with the necessity for loading all cars to maximum capacity, in an effort to bring the average loading to 30 tons for the entire country."

Every year since, the average load per car has been less than in 1923. In 1928, for example, it was 26.7 tons, as compared with 27.9 tons in 1923, a decrease of 4.3 per cent. During the same five years, there has been a marked upward trend in car capacity. In 1923, the average capacity of all cars was 43.8 tons; in 1927, 45.5 tons, and the estimate for 1928 is 45.9 tons, an increase of 2.1 tons, or 4.7 per cent. Box car capacity has shown an even greater increase, the average having been 38.3 tons in 1923, 40.2 tons in 1927, and 41 tons (estimated) in 1928, an increase of 2.7 tons or 7 per cent.

These figures, while frequently quoted, are likely to lead to erroneous impressions, unless all the factors are taken into consideration. For instance the loading of less than carload freight is not controlled by shippers, and presents many problems to the railways, some of which seem almost insurmountable. As a matter of fact, the average tonnage per car for carload traffic has exceeded 34 tons for some years past. The figure for the first nine months of 1928 was 34.9 tons per car, as compared with 34.5 tons for the similar period in 1923.

The fluctuation in the various classes of traffic from year to year also has a direct bearing on this figure. Far example, there were about one million fewer cars of coal loaded during the first nine months of 1928 than in the similar period in 1923. If the same number of cars of this class of traffic had been loaded in the first nine months of 1928 as in 1923, the average tons per car on all carload traffic would have been 35.2. This indicates how traffic fluctuations affect loading, even though there may be an actual increase in the tons per car originated, which was actually the case, so far as coal was concerned. The considerable increase in the movement of fresh fruits, vegetables and automobiles and parts, all of which have a light average loading per car, have likewise materially affected the tons per car.

The entire subject is complicated by the fact that, because of the varying loads and varying distances of less-than-carload traffic, it is an impossibility to determine exact car-loading figures on traffic as a whole. Certain commodity loading figures are exact, so far as carload shipments of those individual commodities are concerned, but average carloading figures comprising all classes of traffic must necessarily be an approximation. The figures reported are obtained by dividing the net ton miles carried by the loaded car miles. An increase or decrease in this figure between any two periods does not necessarily mean an increase or decrease in the actual average loading per car; because the calculation involves differences in the length of haul of the various commodities moved.

For example, assuming that the commodities handled are exactly the same in the two periods, but that the average haul of the lighter commodities has increased, while the average haul of the heavier commodities has decreased, the figures would indicate a decreased car loading, wherease the loading might have been identical in the two periods. This must be borne in mind in any consideration of relative car loadings.

By use of the closest approximation available, it will be seen that the average car loading has decreased 4.3 per cent in the five-year period previously referred to. While this decline may not seem alarming, it has had a definite effect upon operating statistics. In 1928, the number of tons of freight carried one mile was 4.2 per cent greater than in 1923, but it required 8.7 per cent more loaded car miles to handle the business, and involved an increase of 13 per cent in the mileage made by all cars, loaded and empty.

Arguments in Favor of 40-Ton Cars

Those executives favoring the restriction of the standard box car to 40 tons advanced various reasons for their beliefs. Among these is the fact that the

empty car mileage is certain to continue to increase, since, as the centers of population increase in number and area, as they have been doing, the need for railway transportation of manufactured products automatically decreases, the result being that the railways bring into these centers large volumes of food and take nothing out but empty cars. Similarly, they bring in raw materials which are converted into finished products and distributed locally, or without the assistance of the railways. Since the 50-ton box car is efficient only when it is being given the maximum utilization, the argument is advanced that the steadily increasing necessity for empty mileage renders the extra capacity cars less and less useful, as their possibilities for a high percentage of mileage under full load decreases.

The consensus of opinion among those favoring the 40-ton cars is that the prevailing tendency, because of improved transportation conditions and better service by the carriers, is to order in smaller quantities and more frequently. In fact, some of the executives advance the opinion that we are steadily approaching loading conditions which prevail on the British and continental railways, and that there will continue to be an increasing demand for smaller and smaller cars, even less than 40 tons capacity.

The American Railway Association has devoted much study to this tendency. The checks of the various industries made by representatives of the American Railway Association indicates that from 80 to 90 per cent of the failure to utilize car capacity fully rests with the shipper and not with the receiver, except in the case of small dealers. Their surveys do not substantiate the statement that, as far as carload traffic is concerned, there is any general tendency to order in smaller carload quantities. It is likely that more freight is being shipped in less than carload lots than formerly, but the increase in tons per car on carload traffic indicates that the receivers are ordering in larger, rather than smaller, carload lots.

Two of the executives point out that the tendency to order in smaller quantities and the demand for cars of smaller capacity extend even to grain, which has been one of the outstanding commodities in the way of heavy loading. They cite, as evidence, the circular issued by the Grain Dealers' National Association in October, 1928, objecting to the railways building box cars of greater weight capacity, to the elimination of box cars of lesser weight capacity.

This circular has been somewhat misunderstood. It has no relationship to the question of car capacity, but was issued through fear that equipment would be overloaded. The position assumed by the Grain Dealers' Association was wrong, in that the assumption was that many cars were being loaded so heavily that they could not be properly inspected. A check was made which showed that, of 43,448 cars of grain inspected at Kansas City, Mo., Wichita, Kan., and Hutchinson, only 45 cars, one-tenth of one per cent of the total, were so loaded as to prevent proper inspection.

Interesting Surveys Made

Some of the roads favoring smaller cars have made interesting surveys to substantiate their claims. An eastern line, in figuring the cost of the 50-ton box car versus the 40-ton box car, estimates that the larger car carries an extra tare weight of 5,500 lb. This means about 29,000 non-productive ton miles per year, which, at a half a cent per ton mile, makes the extra cost $145. The extra investment cost approximates $33 a year, making a total annual cost of $178 for a 50-ton car over a 40-ton box car. In checking the loads, it was found that only one per cent reached 50-tons. Since a car averages some 35 trips a year, this would mean that a car would receive a 50-ton load only once in three years. Summed up, it would cost this road $524 to save $10 or $15.

A western line advises that the only commodity loaded in box cars, that could not regularly be handled with 40-ton cars, is grain. A survey showed that this represents only 14.7 per cent of the total box car loading on this railway, and further, that a large number of cars of grain were light loads, because of tariff minimums and cars loaded under the clean-out rule. Therefore, with less than 10 per cent of the box car loading consisting of commodities utilizing 50-ton cars, this line feels that the additional tare weight handled in moving empties and loads of other commodities would represent an unwarranted expense.

A southern line made a check of its box car loading for the first nine months of 1928. This showed 109 commodities loaded in box cars, the average loading of 100 of these being less than 40 tons, and only 9 more than 40 tons, and that none of these nine commodities represented any considerable proportion of the total traffic handled in box cars.

All of the lines reporting favorably on the restriction of standard box cars of 40 tons capacity stated that this action would have no effect whatever on the average car loadings on their lines, and all were equally unanimous in predicting that a decrease in transportation costs would result. They were also unanimous in stating that many box cars ordered by them have been and will continue to be of 40-tons capacity.

One of the presidents, who is favorable to the 40-ton cars, comments as follows:

"If the 50-ton box car could be produced for the same cost with the same tare weight as the 40-ton box car, arguments would cease, but this is not the case. Greater capacity, either in size or in dead weight capacity, means more money.

"Granting a good deal of what is said in favor of the 50-ton capacity car, I believe that the proper handling of box car equipment throughout the country would result in greater economy to the carriers in capital expenditure and in operations, if the standard car had a capacity of 40 tons, with the usual ten per cent allowance for overload, and was of a uniform dimension as to length and width inside. That length, in my opinion, should be 40 ft. 6 in. and the width should be 9 ft. inside the nailing strips. The height, except as to automobile cars, should be uniform."

Arguments in Favor of 50-Ton Cars

The executives who favor the use of 50-ton box cars are equally positive as to the correctness of their stand, and offer much evidence in substantiation.

One line, in making an analysis of the movement of its 1928 wheat crop, found that 35,757,170 bushels loaded would have required 23,157 cars of 40-tons capacity, of 17,878 cars of 50-tons capacity. If 50-ton cars had been used exclusively, the crop could have been handled with 5,279 cars less than if 40-ton cars only had been used. This represents a saving of 108 trains, or $170,586, based on average train costs on this line. The saving in switching, at $4.50 per car, represents a further saving of $23,755, while the saving in cooperage would have been $26,395, or a total of $220,736.

Another line made a test, in 1928, of the loading of wheat, oats, corn, flax, barley, rye, cement, spelter,

flour and lumber, in 40-ton cars and in 50-ton cars, with the view of determining whether the increased cost of the latter was justified. The test showed that the average load in the 40-ton car was 36.77 tons, and in the 50-ton car, 41.07 tons, or an increase of 11.1 per cent. The increase in the cost was computed at 3.97 per cent, and the increase in the tare weight approximately 7 per cent.

A railway in the winter wheat belt checked 138 cars of 50-ton capacity, which carried an average of 117,195 lb. of wheat each, earning $248 per car. The same number of 40-ton cars, used in this identical service, from the same loading points to the same destinations, carried an average of 89,709 lb. per car earning $190 per car, or a spread of $58 per car in earnings on a single trip. A similar check was made of cement loadings, in which 46 cars of 50-ton capacity carried an average of 113,217 lb of cement, earning $124 per car. From the same points to the same destinations, 46 cars of 40-ton capacity handled 63,484 lb. per car, the earnings being $69 per car, or a spread of $55 per car in earning capacity.

The Car Service division of the American Railway Association has produced much interesting data proving that, while the question is one for determination by individual railways, in accordance with the traffic necessities existing on their lines, there are many circumstances under which the 50-ton box car is an extremely valuable asset. The division recently made a check on 5,500 cars of export grain moving from Buffalo to New York, over five different railways. This check showed that the average revenue per car was $30 higher on the railway which use the most 50-ton box cars in this service.

According to the railways favorable to the 50-ton box cars, there are a considerable number of commodities, handled wholly or partially in box cars, which normally average more than 40 tons per car. This list includes the following:

Wheat	Salt	Asphalt
Corn	Sugar	Canned Goods
Flour	Sulphur	Lead
Cement	Clay	Zinc
Plaster	Lumber	Spelter
Dried Fruits	Pig Iron	Copra
Anthracite Coal	Bloom Iron	Rye
Bullion	Brick	Sand
Ore	Artificial Stone	Copper
Concentrates	Finished Stone	Phosphate Rock

The executives who favor the greater use of the 50-ton box cars point out that this means efficiency and economy in operation, through heavier net tonnage, decreased per diem, less switching and less necessity for yard storage and industrial trackage. All of them are convinced, moreover, that a restriction in the capacity of the standard box car to 40 tons would mean an immediate decrease in the average load per car, and an increase in the costs of transportation.

Conclusions

The two opposite opinions as to the desirability of restricting the size of the standard box car to 40 tons each are supported by apparently sound arguments, corroborating the conclusion arrived at by the Car Service division, as expressed by Chairman M. J. Gormley, in an article in the *Railway Age* of March 16. This conclusion was, in effect, that the 50-ton box car has ample economic justification for its existence, and the use of 40 or 50-ton box cars, or both, is a question that can only be decided by the individual railways, in accordance with their own traffic requirements.

Viewing the country as a whole, and taking less than carload traffic into consideration, the trend of loading has been distinctly downward, but many factors enter in this; among them, the increase in the number and distance of cars of perishables and the recurring labor difficulties and the declining markets in the coal industry, resulting in a decrease in the number of cars loaded with that commodity.

There can be little doubt, however, as to the importance of continuing the campaign for heavier loading and some of the results of this campaign are apparent.

Smoke Prevention at Riverside Terminal*

ABOUT three years ago the volume of business being handled through the Riverside engine terminal of the Cleveland, Cincinnati, Chicago & St. Louis at Cincinnati, Ohio, became too great to be handled with the facilities provided at that point and instructions were issued to design a modern engine terminal capable of taking care of the traffic requirements.

The city of Cincinnati has built up an efficient smoke inspection system. Under the old system of terminal operation we were receiving considerable complaint on account of the large volume of smoke developed by the firing up of locomotives in the enginehouse with fuel oil and shavings. It was agreed that unless provisions for smoke elimination were incorporated in the new terminal design it could not be considered to be modern.

Considerable thought was given to this phase of terminal design and the following general types of smoke prevention equipment were considered: Suction fans connected to the locomotive stacks through underground ducts and discharging the total gases of combustion through a single chimney; suction fan and ducts as above with the addition of smoke-washing or filtering equipment to remove objectionable matter from the exhaust gasses mechanically; overhead suction fans and washers, each unit capable of taking care of four stalls; and installation of the direct steaming system.

Investigation of the first method of smoke disposal showed that, while it gave very good operating conditions within the enginehouse, the discharge from the chimney serving the house was dense enough with only two locomotives on the line to constitute a violation of the Cincinnati code.

The second and third methods were discarded because their operating cost would give no investment return, while our investigation of existing direct-steaming installations led us to believe that we could combine smokeless operation with a saving in operation cost. Inasmuch as it was necessary to convince the Cincinnati smoke-inspection department of the feasibility of this method we arranged for preliminary tests in their presence at Cincinnati.

In this test a locomotive was filled with hot water and a high-pressure steam line from an adjacent locomotive connected to the blowoff cock of the locomotive on which the test was to be conducted. The grates were covered with coal to decrease the cooling of the boiler by reducing the draft through the flues. The covering of the grates with fuel at the time the locomotive is brought into the enginehouse is an important part of the smokeless oper-

* Abstract of a paper presented by W. T. Wetzel, assistant mechanical engineer of the Cleveland, Cincinnati, Chicago & St. Louis, at the recent Smoke Prevention Association meeting at Kansas City, Mo.

ation. The elimination of moisture from the heating of the coal in the firebox allows it to ignite more quickly due to a minimum dissipation of heat for evaporating the moisture content.

When the boiler pressure had been built up to 150 lb. the fuel bed was ignited with oil-soaked shavings. A careful check was made of the smoke emitted from the locomotive stack and the officials of the smoke-inspection department declared that such operation would be satisfactory to them.

With the question of smokeless firing of locomotives settled satisfactorily, the design and selection of equipment for a direct-steaming plant was next attacked.

[Mr. Wetzell here gave details of the direct steaming installation previously covered in general descriptions of the Riverside terminal of the Big Four and the Fort Worth terminal of the Texas & Pacific, on page 751 of the *Railway Age* of October 20, 1928, and on page 484 of the *Railway Age* of September 15, 1928, respectively. —EDITOR.]

Direct Steaming Prevents Smoke and Saves Fuel

After operating this plant for a period of over a year we have found that the direct-steaming system affords considerable advantage over the old method when it is necessary to blow off a hot locomotive for repairs because with the old method it is necessary to take the locomotive out of the enginehouse and dump the fire at the cinder pit and bring the locomotive back into the house before it can be blown off, while with the direct steaming method it is only necessary to close the steam supply valve to the hanging drop and open the blowoff valve to blow off the contents of the boilers.

It is frequently necessary to blow off engines that are apparently ready for service when one or more of the following defects are discovered: Leaky flexible staybolt cap; rigid staybolt broken, defective or leaky blowoff cock; leaky flues (welding required); leaky washout plugs; leaky arch flue plates or studs; leaky or broken studs for running-board brackets, pump brackets, etc., etc.; leaky dome cap gaskets; leaky or defective pops or whistle; leaky superheater units; defective float or float mechanism or leaky gasket in valve head of low water alarm.

The general operation of this system has been satisfactory (1) to the railway company because of the fuel economy obtained, representing better than 6,000 tons of coal, or an annual saving in fuel of over $18,000, (2) to the enginehouse operating force because of the better working conditions, (3) to the engine crews because of the good firebox conditions obtaining when the locomotive is dispatched, and (4) to those directly connected with smoke abatement, in that better atmospheric conditions exist than heretofore. This is obvious from the following statement of Mr. Silbernagel, superintendent of the Smoke Abatement League of Cincinnati: "I am pleased to inform you that from personal observations, also those of the inspectors of the League at different times since this plant has been placed in operation it is almost impossible to believe that such a big difference in atmospheric conditions could be brought about with the number of engines handled at this place", and from Mr. C. M. Stegner, director of buildings for the city of Cincinnati, who says, "There is no doubt but that the installation of the direct steaming system in the Big Four roundhouse at Riverside is the greatest step forward in co-operation with the smoke-prevention movement that has been taken by any road entering this terminal since the earliest inception of the anti-smoke ordinances".

Insulating and Protecting Coatings

FOR sealing joints in gas mains, for painting structural iron, motors, oil tanks, metal parts exposed to oil or vapors and similar equipment requiring sealing and insulating paints, the General Electric Company is offering a series of lacquers in colors, for use where an oil-resistant, highly protective, durable and flexible insulating coating is demanded. The base of the new lacquers is an alkyd resin produced from phthalic anhydride and glycerine developed in the research laboratories of the General Electric Company, and marketed by that company under the trade name "Glyptal".

These lacquers possess many desirable qualities, including resistance to acids, mineral oils, weather, and alkalies, tenacious adhesion to any surface—including galvanized iron and aluminum—and protection against rust. The Glyptal lacquers are easily applied, dry rapidly to a coating of pleasing appearance, are resistant to acids and mineral oils, and are little affected by high temperatures.

These lacquers are now available in five colors—red, blue, brown, green, and aluminum. They may be applied by brushing, spraying, or dipping, dry dust-free in about 30 minutes, and in approximately ten hours to a hard, smooth finish which is not brittle and which is easily cleaned. No priming or sizing is necessary.

All Glyptal lacquers have basically the same characteristics. The red lacquer, however, is recommended for most effectively sealing joints against oil, water and gas leaks. It adheres strongly to metals, protecting them against corrosion, and has a pleasing appearance and high dielectric strength. It is superior to G-E No. 880 red protective paint, formerly marketed for these requirements.

The blue, brown and green lacquers are primarily for finishing purposes. The aluminum lacquer, withstands extremely high temperatures, and tests show that discoloration is practically imperceptible at 600 deg. F. It is recommended for use on metal subjected to high temperature. This lacquer is of a light-reflecting color, and has been used advantageously to brighten poorly lighted shops.

* * *

"The Lindbergh" Fast Freight on the Alabama, Tennessee & Northern Near Mobile, Ala.

K. C. S. Anti-Trust Case Discontinued

WASHINGTON, D. C.

BY a six-to-five decision the Interstate Commerce Commission has ordered a discontinuance of its proceedings against the Kansas City Southern upon a complaint issued February 14, 1928, alleging violation of the Clayton anti-trust act in acquiring capital stock of the St. Louis Southwestern and the Missouri-Kansas-Texas. The order was entered upon a showing that the K. C. S. had divested itself of the stock so acquired, in connection with the proposed unification of the three southwestern lines, and that the divestment was bona fide and such as the commission may approve. A similar proceeding against the Missouri-Kansas-Texas, instituted March 22, 1928, relating to an agreement between the M-K-T and the K. C. S. in connection with the acquisition of stock of the Cotton Belt, also was discontinued.

Chairman Lewis and Commissioners Eastman, McManamy, Taylor and Campbell dissented, on the ground that the commission should have issued an order in such form as to forbid any direct or indirect future control, and Commissioner Eastman said it seemed to him that the evidence indicated that there is considerable doubt whether the Kansas City Southern interests have parted with actual control.

After reciting the facts on which the complaint was based, relating to the acquisition of stock in 1924 and 1925, in connection with the proposed unification of the three lines which was not approved by the commission, the report, dated July 8 and made public July 17, continues:

The respondents in due time filed answers to our complaints admitting the acquisitions of stock and agreement as alleged, but denying violation of law. It is unnecessary here to discuss these answers in detail, but respondents asserted generally that their acquisitions, accomplished or proposed, were in pursuance of the railroad consolidation policy of Congress as evidenced in the transportation act, 1920. In connection with its answer the Missouri-Kansas-Texas filed application under paragraph (2) of section 5 for authority to acquire control of the St. Louis Southwestern Railway Company and/or the Kansas City Southern Railway Company. On May 25, 1928, the Kansas City Southern filed a supplemental answer stating that subsequent to the date of filing its original answer it had sold all of its holdings of stock of the Missouri-Kansas-Texas, and that it then had no right, title, or interest, direct or indirect, in the stock of that company; whereupon respondent prayed for dismissal of so much of our complaint as related to the acquisition and holding of the Missouri-Kansas-Texas stock. On May 13, 1929, the Kansas City Southern filed a second supplemental answer, stating that subsequent to the filing of its first supplemental answer it had divested itself of all of its holdings of capital stock of the St. Louis Southwestern, and that having completely divested itself of all ownership of stock of that carrier and of all right to vote the stock, and having no right or interest therein excepting a lien on the same to secure payment of a note taken therefore, it prayed that the complaint be fully and finally dismissed. In a supplemental answer filed October 18, 1928, the Missouri-Kansas-Texas stated that its application above-mentioned had been withdrawn and that by supplemental agreement it had relinquished its claim upon the 135,000 preferred shares of the St. Louis Southwestern, which had been redelivered to the Kansas City Southern. Hearing was thereupon set upon the supplemental answers of the Kansas City Southern for the purpose of determining the facts regarding the alleged divestments of stock and whether or not such divestments were of such nature as to warrant discontinuance of the proceedings. Such hearing was held on May 20th and 21st, 1929.

At the hearing it was shown that the 450,000 shares of common stock of the Missouri-Kansas-Texas acquired by the Kansas City Southern, as above described, had been disposed of through the firm of Ladenburg, Thalmann & Company, which has acted for many years as bankers and financial advisers for the Kansas City Southern, as follows:

A total of 162,384 shares were sold on the New York Stock Exchange, 61,400 shares between June 20th and October 20, 1927, 57,700 shares between December 5, 1927, and January 27 1928, and 43,284 shares between March 21st and May 22, 1928. Exhibits were filed showing in detail the dates, the number of shares, price per share, gross sale price, commission, taxes, and net proceeds of these sales. By contract dated May 22, 1928, the Kansas City Southern sold to Ladenburg, Thalmann & Company and the National City Company the remaining 287,616 shares, with the stipulation that the stock should be offered to the stockholders of the Kansas City Southern for subscription on terms therein named. There were 180,699 shares subscribed for and purchased by stockholders and their assignees as shown in detail in an exhibit, and the remainder were sold between June 27th and August 16, 1928, on the New York Stock Exchange by Ladenburg, Thalmann & Company and the National City Company, the details also being stated in the record.

The record further shows that the 155,000 shares of St. Louis Southwestern stock were disposed of as follows:

Between September 24th and October 1, 1928, the Kansas City Southern sold, through Ladenburg, Thalmann & Company on the New York Stock Exchange the 20,000 shares of common stock, and on April 15, 1929, the company sold to New York Investors, Inc., the remaining 135,000 shares of preferred, the latter in accordance with a contract, copy of which was filed in the record. Delivery of the contract shares was made on April 17, 1929.

Representatives of the financial houses employed in these sales negotiations testified at the hearing, giving further details of the transactions and fully supporting the statements of the respondent to the effect that the sales were unconditional and without any understanding or agreement, direct or indirect, express or implied, that the stock were to be held or used in any manner for the benefit of the respondent.

Under section 11 of the Clayton Act we are authorized by order to require a railway company to cease and desist from violation of the law and to divest itself of stock unlawfully held, in manner and within the time fixed by our order. Where, as in this case, the carrier has without the issuance of an order divested itself of the stock alleged to be unlawfully acquired and held, it is only necessary for us to determine whether or not such divestment is *bona fide* and such as we may approve. We find upon the record that the divestments of stock of the St. Louis Southwestern Railway Company and the Missouri-Kansas-Texas Railroad Company by the Kansas City Southern Railway Company as hereinbefore described, should be approved.

An order will be entered approving the divestments and discontinuing the proceeding.

Commissioner Eastman, in his dissenting opinion in which Commissioners McManamy and Taylor joined, said the majority report was based upon a misconception of the commission's duties and that it does not determine whether provisions of the act have been violated. After discussing the disposition of the stock and the election of Michael Cahill, Richard H. Swartout, E. A. Pierce and S. W. Fordyce as directors of the M-K-T, he says there is no clear indication that the interests which dominate the K. C. S. have ceased to dominate the M-K-T. "Whether these doubts could be resolved into facts which would justify a finding of control in a court of law I do not know"; he said, "but that, as I see it, is not the point. Our power to prescribe the manner of divestment was given to us for the express purpose of avoiding such doubts which are difficult to resolve into proven facts. I believe that in these cases we should determine, first, whether provisions of the Act have been violated, as I think they have been, and then proceed to the issuance of an order of the kind which the Federal Trade Commission has used and which the Supreme Court has approved."

Chairman Lewis joined in the conclusion of the minority that the commission's duty in this proceeding was to ascertain whether the provisions of the act have been or are being violated and, if a violation is found, to enter a "cease and desist" order. There having been a violation, he said, "our order should be in such form as to forbid any direct or indirect future control."

Communications and Books

Producer Inspection of Ties

PHILADELPHIA, PA.

TO THE EDITOR:

In the editorial in your issue of May 4, entitled, "Grade-Marked Ties" the statement is made that "the grading (grade-marking) of ties will greatly simplify the problems of the railways in the purchase of ties for it will eliminate the necessity for other than *casual* inspection and will make unnecessary the large and expensive inspection service now maintained". The parenthesis and underscoring are inserted.

Apparently the premise is that an adequately trained and supervised inspection force will be created and maintained by each substantial producer and vendor of ties. That must contemplate the elimination of farmers and other small producers of ties in their present capacity as vendors directly to consumers. Obviously the many thousands of farmers and other producers, each selling moderate quantities of ties direct to railroads, could not afford to maintain an independent inspection force, except on a co-operative basis. Nor can small producers logically be excepted from any general scheme of grade marking by manufacturers. Such a course would still require the maintenance of railroad inspection forces, and it is not likely that one class of producers would be content to accept close examination and grading of their product while that from another class was accepted on the basis of a casual inspection by the purchaser.

Past experience in the grade marking of forest products demonstrates that any scheme of producer inspection and grading of real value to consumers as a whole must be policed by an independent and authoritive bureau, the decisions of which are final and binding upon producers and consumers alike. H. C. Berckes secretary-manager of the Southern Pine Association, is quoted as saying that "without this monthly check (regular inspection made by expert inspectors of the Association) of the efficiency of the graders, the mark on the lumber would mean little to the purchaser because he would have no assurance that the stock was properly graded before being marked".

It is, therefore, a fair assumption that the proper grading of ties by producers would require the organization, training and supervision of an expert inspection force, an enterprise of considerable magnitude and expense. The cost of such inspection must be paid for by the user of ties, and the cost of ties in track will include that item of expense, whether hidden in the purchase price or segregated.

Any inspection by the purchaser subsequent to the branding, no matter how casual, is an additional expense and there is considerable room for doubt that vendors' inspectors can grade ties at less cost than that of the same service performed by a well-managed corps of railroad inspectors.

It should also be appreciated that the quality of a tie when branded may be no criterion of its worth when delivered. The movement of ties from stump to track is often seriously interrupted, as all producers will testify. A tie branded as size 5 today may easily be an absolute reject prior to delivery because of improper or too extended storage, a condition which a casual inspection by consignees would often fail to detect.

The foregoing comments should not be construed as in opposition to the identification of source and quality of product by vendors. Such a plan is deserving of every support. In advancing the grade marking of ties, however, let us not fall into the error of believing that grade marking by independent inspection forces maintained by producers will insure correct branding, at no cost to users, and that purchasers can adopt a casual method of inspection.

Responsible and honest producers and vendors of ties are not opposed to registering their appraisal of the worth of their product, but will be loathe to subscribe to any plan which will depend upon a casual inspection by purchasers to detect sharp practise, common to all bartering, indulged in by some vendors of forest products. Honestly identified products need the protection of adequate purchaser inspection of *all* material delivered.

When buyers learn that they should consistently and uniformly inspect all ties they will win the "battle of wits" referred to in your editorial, and will unquestionably earn substantial dividends on inspection costs. The buyer of "cheap" ties deludes only himself and his management.

H. R. CONDON,
Vice-President and General Manager,
Delaware Wood Preserving Co.

New Books

The Labor Movement in the United States, 1860-1895, by Norman J. Ware. Bound in cloth, 409 pages, 8 in. by 5 in. Published by D. Appleton and Company, New York. Price $3.

In the present volume Mr. Ware continues the survey of the labor movement in the United States, begun in his essay, "The Industrial Worker, 1840-1860." It is thus a review of labor organization activities during that period between the Civil War and the turn of the century—a period which saw a rapid development of the factory and a firm fixation of its attendant wage system upon the economic life of the nation.

The groping of the workers for an organization during the post-war years is vividly sketched as the author proceeds to outline the early and futile attempts at national organization up to the impressive rise of the Knights of Labor, which is declared in the introduction to have become in 1886 "the most imposing labor organization this country has ever known; and closed the doors upon its long departed glory in 1917, when John W. Hayes, its last master workman, stored the remains of its records and furnishings in a leaky shed behind an insurance office in Washington, D. C. But the Order was dead long before Hayes buried it.....when its importance as an industrial society ceased."

The latter was in 1894 and Mr. Ware has written most interestingly of the Order's rise and fall, of its successes and reverses in industrial disputes, its internal strife and dissensions and finally its supplanting by the American Federation of Labor. A keen sense of the drama in the movement and due consideration of the personality of each leader who appeare on the scene contribute much toward making this addition to labor organization history a most fascinating story as well.

Practical Railway Painting and Lacquering. By H. Hengeveld, master painter, Atlantic Coast Line; C. P. Disney, bridge engineer, Canadian National, and William J. Miskella, M. E., director, Finishing Research Laboratories, Inc., 242 pages, illustrated. 6 in. by 9 in. Bound in gray leather. Published by the Finishing Research Laboratories, Inc., Chicago, and distributed by the Simmons-Boardman Publishing Company, 30 Church street, New York. Price $3.50.

This book, which has been prepared as a handbook for railroad men, is the fourth volume of the practical finishing series being prepared by the Finishing Research Laboratories, Inc. A review of this book would not be complete without telling something about the co-authors. H. Hengeveld is master painter, Atlantic Coast Line, Waycross, Ga., and has served as a supervisory officer in railroad equipment painting work for over 39 years. He is a past president of the Equipment Painting eSction, American Railway Association. C. P. Disney, bridge engineer, Canadian National, is well-known among railway maintenance department engineers. William J. Miskella is director of the Fininshing Research Laboratories, Inc., and is the sole author of the first three volumes of the practical finishing series.

The book is divided into five parts: namely, General Information; Painting and Lacquering of Locomotives, Freight and Passenger Cars; Painting of Signal Equipment, Painting of Bridges, Buildings and Water Service and Lacquering of Elec-

tric Railway Cars. Six of the thirteen chapters included in Part I are devoted to such items as spraying equipment, accessory equipment, portable cleaning equipment and scaffolding. The other chapters included in this section are on such subjects as lacquers, other paint materials, housekeeping and hazards, and ornamentation. Part II consists of six chapters devoted to the discussion of such subjects as shop cleaning methods and equipment, freight car painting, passenger car lacquering, locomotive finishing, painting highway motor coaches, and cleaning railway equipment. One chapter is included in Part III on the painting of signal equipment. Six chapters are incorporated in Part IV which cover the following subjects: Steel bridges, concealed corrosion, the Quebec bridge, other structures, building painting, and water service. Part V contains a single chapter which is devoted to the subject of the lacquering of electric railway cars.

The book is well illustrated and contains a wealth of information on equipment painting, which is not only of value to master painters, but to purchasing agents and mechanical department supervisory officers as well.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Hermes-or the Future of Chemistry, by T. W. Jones. "To commercialized man ... transport must be ranked as one of the primary needs, if not the first essential, of his civilized state... The transport of the future . . . will be mobilized by electrically and thermally driven engines, whether it be road or air traffic. Since our supplies of coal and petrol are limited to the amounts stored in the earth, the day will come when they are exhausted; but new fuels will have been synthesized to take their places as sources of power for thermally-driven traction, for it is probable that for certain types of transport we shall always rely upon thermal power ..." p. 24-36. One of the "Today and Tomorrow series" of special interest to those who like to eat and those who concern themselves with fuel problems. 88 p. Pub. by E. P. Dutton & Co., New York City, $1.

Military Engineering-Railways-1929, by War Office Gt. Brit. "Railways have developed their marked superiority over all other means of land transport as a means of moving large forces and material in bulk over long distances within a reasonable time." p. 11. 318 p. 49 plates. Pub. by H. M. Stationery Office, London, England. 2 shillings, sixpence.

Periodical Articles

I. C. C. May Seek To Map Mergers. "What the commission does or does not do early in the fall is likely to provide the key to the subsequent history of the consolidation era which the Transportation Act of 1920 was intended to begin." Barron's, July 15, 1929, p. 23.

Railroad Lingo-A Story in Dialect- With An Essay on the Language of the Rails, by Grover Jones. "The author. . . has spent much of his time as an observer of railroading." p. II (contents). Bookman, July 1929, p. 524-527.

Syria Imported 80 Per Cent More American Automobiles in 1928. Regular Service Across the Desert, by George L. Brandt. "The desert crossing by camel caravan ordinarily takes from 30 to 40 days, though before the inauguration of the regular trans-desert motor service after the 1923 crossing, mail was sent once a month from Damascus to Bagdad on racing camels which made the trip in 8 days. The usual time for an automobile is now 36 hours; trucks make the trip in about 48 hours..." p. 42-43. Commerce Reports, July 1, 1929, p. 42-43.

Wage Incentives for Direct Labor—The Ten Plans Found by Analysis to Meet All Requirements for Direct-Production Work, by Charles W. Lytle. Nine "essential characteristics of any extra financial incentive plan" are listed on p. 493. Mechanical Engineering, July 1929, p. 493-502.

What's Next in Ocean Travel? by Edward R. Armstrong. "Eight great seadromes, strung across the Atlantic..." one of which should be named "Chanute." Construction and location plans summarized along with servicing methods. Nation's Business, July, 1929, p. 33-34, 146.

Looking Backward

Fifty Years Ago

Another exciting turn in the controversy between the Atchison, Topeka & Santa Fe and the Denver & Rio Grande took place on July 14 when the federal court dismissed the receiver appointed by the state court for the Rio Grande, stating that his appointment had been obtained by collusion with officers of the company to prevent the restoration of the property to the Santa Fe. The receivership was characterized as a subterfuge and the control of the Rio Grande was ordered restored to the Santa Fe.—*Railway Age,* July 17, 1879.

A committee of the Master Car-Builders' Association which sent questionnaires to yard and trainmen to discover the most prevalent causes of injury has recommended several improvements in the construction of freight cars. The committee states that injuries can be reduced by greater uniformity in the height of the draw-bar, discontinuance of double dead woods on each side of the draw-bar and the substitution of one dead wood above the draw-bar, placing of two handles, one near each corner at each end of the car, discontinuance of the small platform used to fasten the brake pawl and placing of the ratchet wheel and pawl on the roof.—*Railroad Gazette,* July 18, 1879.

Twenty-Five Years Ago

W. B. Storey, who in June, 1903, was placed in charge of the construction of the new line of the Atchison, Topeka & Santa Fe between San Francisco, Cal., and Eureka, has completed that work and has resumed his duties as chief engineer.—*Railway Age,* July 22, 1904.

An opinion was filed in the United States Circuit Court at Trenton, N. J., on July 15, granting a preliminary injunction restraining the putting into effect of the proposed plan for the distribution of the assets of the Northern Securities Company in the proceedings instituted by Edward H. Harriman, president, and Winslow S. Pierce, general counsel of the Oregon Short Line. The proposed pro rata distribution of Northern Pacific and Great Northern stock would have placed the Union Pacific in possession of a large share of Great Northern stock, yet not enough to obtain control. At the same time the Union Pacific would have lost the control of the Northern Pacific, with which it went into the merger.—*Railroad Gazette,* July 22, 1904.

Ten Years Ago

The hearings on the general question of the future of the railroads after their return to private management were begun before the House Committee on Interstate and Foreign Commerce at Washington on July 15. While the Esch-Pomerene bill to amend the act to regulate commerce is the only bill now before the committee, Chairman Esch, in a preliminary statement said that the hearings would cover a broad field of inquiry.—*Railway Age,* July 18, 1919.

During the first six months of 1919 the railroads of the United States carried 4,276,949 troops on special and regular trains. In addition about 2,000,000 officers and enlisted men made railroad trips while on furlough. Including approximately 1,000,000 discharged men who traveled from camps to their homes, the total for the six months was more than seven and one-quarter million, military passengers. The average journey of troops carried on special trains was 660 miles.—*Railway Age,* July 18, 1919.

Odds and Ends of Railroading

Adams

The name of Adams may be a revered one in American history, but to clerks and others on the New York Central, it is just a pain in the neck. The reason is that there are five stations named Adams on the New York Central system. There is one each in Illinois, Indiana, Massachusetts, Michigan and New York.

The Executive Service Record

H. F. Smith, senior vice-president of the Nashville, Chattanooga & St. Louis, probably holds the service record for railway executives. Mr. Smith has spent 64 years in railway service. He took his first job in February, 1865, at Huntsville, Ala., as clerk and telegraph operator on the United States Military Railroad.

A Busy Railroader

Roscoe E. Andrews is agent for the Baltimore & Ohio at Palestine, Ohio. But that is by no means the extent of Roscoe's activities. He has been town clerk and treasurer for 20 years, he serves as Republican committeeman, and he has gone through all the chairs in four fraternal organizations.

A Presidential Train Order

R. A. McCranie, assistant general manager, Atlantic Coast Line, is the proud possessor of what is believed to be the only train order ever autographed by Ex-President Calvin Coolidge. The order governed the movement of the special train which took Mr. Coolidge and his party to Mountain Lake, Fla., to dedicate the Bok Singing Tower there.

Tall Story Department

Perry Knoderer has been an engineman on the Southern for many years. He is proud of his record for safety and avoidance of injuries. But Perry should stay in his cab, where he is safe. While walking around in a hail storm in Louisville the other day, he got his foot in the way of a nine-inch hail-stone, which smashed his toes badly and laid him up.

N. Y. C.-Penna. Competition

The New York Central and the Pennsylvania compete annually on the baseball field, and in other sports endeavor for the dual championship, but we will wager that here is one competition they haven't thought of, namely, which railway has the most stations beginning with "New" on its lines. The Pennsylvania wins by the narrow margin of 52 to 48 in this connection. Both lines easily lead all the other railways in the country in this respect.

Conductors Know Everything

A traveler in Arizona, after having been on a train a considerable length of time, finally became bored when he realized the train was late. When the conductor came through the traveler hailed him.

Traveler—"Conductor, why is this train so late? It seems we are never going to reach my town."

Conductor—"Well, you see, at night it gets so cold around here that the fireman can not keep up steam in the engine, and in the daytime it gets so hot that the rails expand and push the towns farther apart. That is why we are late."

Green Pastures

Recently while a Reading engine running backward was rounding a curve at Bloomsburg, Pa., a cow was noticed grazing close to the track. As she did not move out of the way, the train was stopped, and the crew, upon investigation, found that the animal was actually chained fast to the rail. The owner of the cow, who was close by, hearing the commotion, came to get her. After members of the crew asked him why the animal was found in this manner, he replied that he chained her there because the grass was a little greener close to the track than it was under the trees at the foot of the embankment.

Former Hocking Valley Operator Now Owns 900-Acre Ranch in Montana

Back in November, 1911, George Sykes, first trick operator of the Hocking Valley, at Marion, Ohio, resigned his position and with a few dollars, left for the West to seek his fortune. Finding Montana inviting, and since at this time the Chicago, Milwaukee & St. Paul was building a line into Great Falls, he got a job in the railroad's construction camp. Soon after his arrival he began homesteading a quarter-section of farm land within 50 miles of Great Falls. That was his start. Year by year he has added to his holdings, until now, he owns and operates a 900 acre ranch and is quite prosperous.

Embarrassing Moments

She was a rather stout decidedly bespangled dowager, who flounced up the aisle of the 5:29 at Grand Central terminal in New York one afternoon recently in her best high hat manner.

One could see from her every gesture that she regarded the great commuting army, with whom she was about to travel, as mere rabble. Gingerly she drew a ticket from her purse and tucked it in the top of the seat ahead of her before starting on her novel.

As the car began to fill, she managed to keep a seat to herself by glaring haughtily at all who approached, and it was with this same icy stare that she turned to the conductor when he asked her for her ticket.

"I placed it where you could have taken it without disturbing me," she chided testily. "What's that you have in your hand there now?

"A weighing machine card, giving your weight, madam," he replied, while from her fellow travelers came just the suggestion of a snicker.—New York Sun.

The "Best Friend"

To provide contrast, a replica of the "Best Friend", an early American locomotive, and its train, has been put on exhibition in the Union Station at Washington, D. C., where it is attracting considerable interest. The original engine was built in 1830, at West Point, N. Y., and was used on the South Carolina Railway. It traveled at the "terrifying" speed of 12 miles an hour.

The "Best Friend" in Washington Union Station

NEWS of the WEEK

The Lehigh Valley's "Black Diamond" at Mountain Top, Pa.

About 40 Persons Were Injured when five cars of a Florida-New York passenger train on the Atlantic Coast Line were derailed near Enfield, N. C., on July 10.

The Canadian National, the Central of Vermont and other roads in the Canadian National System have adopted a revised book of train rules, the standard code, that goes into effect on Sunday, July 28. The issuing of the new book has been accompanied by extensive examination and re-examination of employees throughout the system.

Signal Department Employees of the Canadian National and the Canadian Pacific have been granted wage increases amounting to 3 cents per hour. The advance affects maintainers on the Canadian Pacific and signalmen, maintainers, assistants and helpers on the Canadian National. Helpers on the Canadian Pacific were given a wage increase of 4 cents per hour.

Hudson Bay Railway Completion Delayed

The necessity of using construction forces to fight bush fires has delayed work on the Hudson Bay Railway so that its completion for the operation of passenger trains is not expected before November 1, and the celebration of the opening of the line by the driving of a gold spike will probably be held in the Spring of 1930. Construction has also been hindered by the difficulty of obtaining sand from frozen gravel and sand deposits.

S. P. Installs Telephone System on the "Cascade"

The Southern Pacific plans the installation on the Cascade, operating between San Francisco, Cal., and Portland, Ore., 721 miles, of the first inter-car telephone system to make its appearance on a passenger train, for use by passengers. A handset type of telephone instrument will be placed in each Pullman car and no fee will be connected with its use.

With this system it will be possible for passengers to send and receive messages from any part of the train. It is expected that passengers will make use of it to order meals from the diner, inquire if seats are available in the diner, order refreshments from the club car, make appointments with the barber, call the maid and summon train attendants without the necessity of walking through the train. The telephone lines will lead to the dining car steward's desk, the club car attendant's station, the ladies' lounge and the barber shop. A combination dial and push-button system will be used to make connections.

I.C.C. Report on Private Cars

The Interstate Commerce Commission, on July 18, made public its report in the private car investigation by Commissioner McManamy following closely the lines of the previous proposed report. The Commission finds that transportation or movement of private passenger cars by one carrier for another or its officials free or at other than published tariff rates contrary to the provisions of the Interstate Commerce Act and that such transportation is unjustly discriminatory and preferential and prejudical while charging certain minimum fares and revenue for the movement of privately owned or chartered cars.

Transportation of persons in private cars, including berth and meals, at a rate charged passengers provided with only ordinary coach accommodations is also held discriminatory, prefential and prejudicial. No order is issued but carriers are expected to cease and desist from violations of the act found.

Electric Traction Engineers Study Insulation

About thirty engineers representing railroads and power companies were guests of the Ohio Insulator Company at Barberton, Ohio, on July 11 and 12. After a trip through the plant in which porcelain insulators are manufactured, demonstration tests of various types of insulators were made in the indoor and outdoor testing laboratories maintained by the company. Practically all types of transmission line towers and several short lengths of distribution wiring for electric traction systems have been erected at the field laboratory. Facilities are available for making 25 and 60-cycle, high-voltage tests up to three million volts and also for high frequency and impact tests. The tests demonstarted the characteristics of the various types of construction, emphasizing particularly the effect of lightning and other voltage disturbances. A subsequent talk by A. O. Austin, chief engineer, Ohio Insulator Company, outlined economic and practical problems involved in designing and building transmission lines and distribution systems.

Old Locomotive Makes Final Run

"Old Peppersass," known as the first mountain climbing locomotive, will again ascend to the Summit of Mt. Washington, N. H., on July 20 in a special ceremony during which this old relic of some 60 years ago will be transferred to the Boston & Maine from the Baltimore & Ohio, in whose historic collection it has rested since 1893.

During the ceremony, a bottle of water from the little Twin Lakes of the Clouds, under the summit of Mt. Washington and more than a mile above sea level, will be broken over the locomotive before it starts its last climb to the top. Then Daniel Willard, president of the Baltimore & Ohio will present the relic to George Hannaeur, president of the Boston & Maine, who in turn will present it to Charles W. Tobey, governor of New Hampshire, for dedication to the state, A special museum will be prepared for it.

"Old Peppersass," a wood-burning locomotive, was built in 1863 by Sylvester Marsh, of Littleton, N. H., for the purpose of carrying passengers up the grade of Mt. Washington, and assisted at the time in building its own track up the mountain side.

Safety Section Circular for August

"Sudden stopping, starting, lurch or jerk of locomotive, car or train" is one of the serious items in the accident records of the Interstate Commerce Commission, no less than 30 employees having been killed by such a cause in 1928 and 2,808 injured. Sudden application of brakes, etc., added to the foregoing, makes a total of 33 killed and 2,996 injured.

This is the subject of the circular of the Committee on Education, A. R. A., E. R. Cott, chairman, which has been issued for the guidance of safety committees in the month of August. The circular is accompanied by a poster showing the careless attitudes often assumed by freight trainmen in switching. Trainmasters and yardmasters are enjoined to be alert and notice when men place themselves in an unsafe position; to prevent accidents by educating the trainmen. Most frequently the injuries do not occur as a direct result of sudden starts or stops, but because the employee has not made his hold secure, as stops and starts can and should be anticipated. Train service employees should be taught to place themselves at all times in a safe position. Conductors and flagmen should occupy the cupola of the caboose when their duties do not require them elsewhere.

Railway Photographic Exhibit at Baltimore

The waiting room of the Mt. Royal station of the Baltimore & Ohio at Baltimore, Md., was put to an unusual use recently, when it became temporarily a photograph salon for an exhibition of a large number of photographs in an exhibit of contemporary photography by the members of the Baltimore Photographic Club. The photographs, which consisted of railroad subjects either directly or indirectly, created unusual interest for those visiting the station. A number of the pictures including the four prize photos are shown in the accompanying illustration. The prize winners are the four to be seen in the center of the picture, at either side of the announcement sign.

Chicago 1933 Fair to Depict Railway Progress

A pageant, depicting a century of progress in the transportation field, will be one of the features of the centennial celebration at Chicago in 1933. Edward Hungerford, who was director of the Fair of the Iron Horse staged by the Baltimore & Ohio in 1927, has been engaged in an advisory capacity for the 1933 pageant.

In addition to a huge pool placed in front of a grandstand to show the evolution of marine transportation it is planned to construct various railroad structures to display to the best advantage the progress in rail transportation. Several lines of track will be laid, a mile or more in length, upon which both old and new rolling stock will be operated. One of the railroad structures will be a roundhouse with turntable. For the immobile parts of the railroad and other exhibits, exposition buildings will be constructed.

In an announcement concerning the transportation phase of the Fair, Rufus C. Dawes, president, stated that it was planned to include early and modern European locomotives and cars as a part of the railroad exhibit. An aviation building and hangars will be constructed for the air transport exhibit.

A Section of the Photographic Exhibit in the Baltimore & Ohio Station at Baltimore, Md.

Southern Observes 72nd Anniversary of Memphis & Charleston

The ceremony of the "Marriage of the Waters," which was solemnized at Memphis, Tenn., in 1857 to celebrate the completion of the Memphis & Charleston, forming, in connection with other lines, a continuous railroad between the Atlantic ocean and the Mississippi river, was reenacted on July 9 when Mayor Thomas P. Stoney of Charleston, S. C., poured a barrel of water from the Atlantic into the Mississippi at Memphis.

Mayor Stoney rode into Memphis on the "Best Friend of Charleston," the first locomotive built in the United States to be used in actual railroad service, which has been reproduced by the Southern and is now on a tour of the South. He was welcomed by Mayor Watkins Overton of Memphis at the original terminus of the Memphis & Charleston, which is still known as "Charleston yard," and the two mayors joined in the repetition of the ancient rite. The "Best Friend" was built in New York for the South Carolina Canal and Railroad Company, was brought to Charleston by ship, and made its first scheduled run on Dec. 25, 1830. When completed to Hamburg, S. C., on the Savannah river opposite Augusta, Ga., 133 miles, in 1833, the South Carolina line was the longest continuous railroad in the World. It and the Memphis & Charleston (both now parts of the Southern) formed the eastern and western links in the line between the Atlantic ocean and the Mississippi river.

Minnesota Court Dismisses Actions Brought by Non-Residents

The District Court of Steele County, Minn., on June 18 rendered a decision which, if sustained in the Supreme Court of Minnesota, will prevent the practice that has been prevalent of bringing suits in Minnesota courts against railroads for freight and passenger claims and injuries to employees when the accidents occurred in other states. In this decision five personal injury cases, involving the suits of H. N. Boright and others against the Chicago, Rock Island & Pacific, and the Chicago, Milwaukee, St. Paul & Pacific, were dismissed when the court upheld the railroad's motion on the ground that the trials at Owatonna, Minn., would constitute an unreasonable and unnecessary burden on interstate commerce.

All five actions were begun under the Federal Employers' Liability Act. The case brought against the Milwaukee grew out of an occurence at Janesville, Wis., 291 miles from Owatonna, which was the residence of the deceased and of all of the witnesses of the accident. In the cases against the Rock Island it would have been necessary to bring the witnesses for both the plaintiff and the defendant from Kansas City, Mo., and Kansas City, Kan., from Newton, Iowa, and from Iowa Falls, Iowa, each of which is some distance from Owatonna.

Judge Fred W. Senn, in his opinion, stated that decisions of other courts have recognized the fact that it is not reasonable for a non-resident plaintiff to sue a non-resident defendant where the suit would constitute a burden upon the interstate commerce handled by the defendant, and that the court also has the power to dismiss the suit on the broader ground of relieving the courts and taxpayers from the burden of litigating foreign railroad cases. The cases are brought in the state court of Minnesota, he said, from a desire to sue where verdicts are larger and for convenience of practice.

New York Railroad Club Annual Outing

The New York Railroad Club held its annual outing at the Travers Island property of the New York Athletic Club on July 11, and was attended by approximately 850 members and guests. An account of the entertainment, specially prepared for the *Railway Age* by a member of one of the committees in charge of arrangements, follows:

"The morning of this sparkling summer day was given over to cow pasture pool at the Winged Foot Country Club; about two hundred members and guests competed for various prizes, according to their avowed skill in previous matches, with the following disappointing results to everybody else:

Class A.	1. Low Gross	H. S. Hammond	83
	2. Low Gross	D. D. Cooke	86
	Low Net	Albert Hedley	75
B.	1. Low Gross	P. M. Guba	90
	2. Low Gross	H. Schaeffer	92
	Low Net	M. F. King	73
C.	1. Low Gross	H. C. Lunger	94
	2. Low Gross	Geo. T. Cooke	97
	Low Net	C. Monroe	72
	Guest Prize	J. F. Riddell, Jr., Low Gross	76

Brady Cup—Low Net—H. Parker 71
Kicker's Handicap—E. G. Davis 76
Consolation—W. R. McMunn — (score deleted)

"The afternoon started at Travers Island when the special train from Grand Central pulled into Pelham at 12:32. Preceded by the New Haven band from the Readville Shops, the pleasure-bent railroaders marched to the club ball diamond. There, a loosely assorted team of vice-presidents, superintendents, chief clerks, tallowpots and car knockers dressed in Yama Yama suits ran up scores and gave other national pastime exhibitions that were of no interest whatever to scouts from the American League. The game was won by somebody, but as the adding machine got hot boxes from overwork early in the second inning, nobody yet knows the result. And nobody cares.

"In a large tent a real, honest-to-goodness circus with bare-back riders, leaping dogs, hair-raising aerial acts, a boxing kangaroo, sawdust and everything was the main attraction of the day and so popular was this feature that there wasn't a railroad man absent during the performance. The collapse of a small section of reserved seats added a note of interest during the afternoon. No casualties, due either to good luck or the general toughness of railroad men. There were also the outside accessories of a real circus including a side show under its own canvas.

"Other enjoyable diversions of the afternoon included speed boating on Long Island Sound, swimming, in the same, tennis, quoits and a general course in getting acquainted. About 130 participated in the quoits contest, the first prize was won by A. A. Borgading, the second by C. G. Waldie, the third by J. K Aimer and the fourth by J. N. Ebling.

"Dinner was served at seven attended by the usual robust songs and marked by an entire absence of speeches, for which Eliot Sumner, president of the Club, and Ros Cooley, general chairman of the outing, should be given two diamonds in the gold medal they deserve for this best of all outings to date."

* * * *

The Week's Best
Railway Bargains

G.W.R.

HALF-DAY TRIPS from PADDINGTON STATION.

Depart. Return Fare.

SATURDAY, JUNE 15.

11 0 a.m. OXFORD 4/6

SUNDAY, JUNE 16

*10 0 a.m. COMBINED RAIL & ROAD MOTOR TRIP to HAYTOR ROCKS & BUCKFAST A BEY. (Rail to Newton Abbot, Saloon Motors from Newton Abbot to Haytor Rocks & Buckfast Abbey & back, home by rail from Newton Abbot) 15/-

*10 0 a.m. EXETER 9/-
DAWLISH, TEIGNMOUTH ... 9/6
NEWTON ABBOT, TORQUAY, PAIGNTON 10/-

*10 55 a.m. YATTON, WINSCOMBE, AXBRIDGE 4/6
CHEDDAR, WOOKEY 4/6

*11.30 a.m. YEOVIL 4/6
WEYMOUTH 7/6

11.35 a.m. READING 3/-
UFFINGTON, FARINGDON ... 4/6
SWINDON, WOOTTON BASSETT DAUNTSEY 5/-
MALMESBURY, CHIPPENHAM, CALNE, MELKSHAM 5/-

*12.5 p.m. WESTBURY 5/-
FROME, WITHAM, WANSTROW 5/6
CRANMORE, SHEPTON MALLET 6/-
WELLS 6/6

WEDNESDAY, JUNE 19.

*11.5 a.m. WESTBURY 5/-
FROME 5/6
SHEPTON MALLET 6/-
WELLS, YEOVIL 6/6
DORCHESTER 7/-
WEYMOUTH 7/6

SATURDAY, JUNE 22

11 21a.m. BANBURY, LEAMINGTON SPA WARWICK, STRATFORD-ON AVON 5/-

*Restaurant-Car Trains.

L·N·E·R

The EASTERN BELLE PULLMAN LIMITED
EXCURSIONS DE LUXE
from LIVERPOOL STREET

At 11.50 a.m. to FELIXSTOWE.
Tuesdays " CLACTON-ON-SEA.
Wednesdays " FRINTON and WALTON.
Thursdays " DOVERCOURT and HARWICH.
Fridays " THORPENESS & ALDEBURGH.
FARES: First, 10/6; Third, 6/6
Luncheon and supper at special tariffs.
At 9.35 a.m.—Sundays to CLACTON-ONSEA.
FARES: First, 10/6; Third, 6/6.
Refreshments served on trains.
Fares include Pullman supplement.
(Metin Special Pamphlet.

RAIL AND BOAT TRIP
From LIVERPOOL ST., 11.55 a.m.
each Wednesday to FELIXSTOWE AND HARWICH via Ipswich and River Orwell.
5/6 Return.

FULL DAY TRIP
TO-MORROW (Thursday)
TO
YARMOUTH 10/-
with bookings for 5, 8 and 15 days.
Liverpool St. dep. 7.45 a.m.

LONG HALF-DAY TRIPS.
SUNDAY, 16th JUNE.

From KING'S CROSS.

Dep. a.m.	To	Fare
10.0*	Leeds	8/6
10.10	Grimsby To	6/-

* Restaurant Car on this train.

From MARYLEBONE.

Dep. a.m.	To	Fare
10.0	Nottingham ..	6/6
10.0	Sheffield ..	6/-
10.5	Loughborough ..	4/-

From LIVERPOOL STREET.

Dep. a.m.	To	Fare
11.17	Cambridge ..	4/-
11.10	Ely	4/6
11.13	Huntingdon ..	6/-

Bookings also for 5, 7 and 14 days.
THURSDAY, 20th JUNE.
From KING'S CROSS at 11.25 a.m. to Huntingdon, 4/-; Peterborough, 6/6; SKEGNESS, 7/-.
With bookings for 5, 8, and 15 days.

Dep. a.m.	To	Fare
10.5	Bushy	2/-
10.5	Lutterworth ..	5/-
10.5	Leicester	6/-

Dep. a.m.	To	Fare
12.15	Clacton-on-Sea ..	4/6
12.20	Frinton-on-Sea ..	4/6
12.20	Walton-on-Naze ..	4/6

MID-WEEK Half-Day TRIPS
From Liverpool Street.
WEDNESDAYS
At 11.0 a.m. Lowestoft 8/-; Yarmouth 6/6
At 11.55 a.m. Dovercourt, Felixstowe, 5/-.
THURSDAYS
At 1 p.m. Clacton, Felixstowe and Walton 4/6.

L M S

HALF-DAY TRIPS.

From ST. PANCRAS.

Depart. Return Fare.

SUNDAY, JUNE 16th

10.0 a.m. WELLINGBORO' 4/6
LEICESTER 5/-
NOTTINGHAM 7/6

WEDNESDAY, JUNE 19th

11.0 a.m. MATLOCK BATH 7/6
MATLOCK 7/6
(Restaurant Car)

From EUSTON.

DAY TRIP to
BLACKPOOL
SATURDAY, JUNE 15th.
RETURN 15/ FARE.
Leaves Euston 6.30 a.m.
Same fare from Suburban Stations.

SUNDAY, JUNE 16th.

10.9 a.m. NUNEATON 9/-
LICHFIELD 6/-
LIVERPOOL 10/-
SOUTHPORT 11/-

Reserve your Seat NOW for these SPECIAL EXCURSIONS from EUSTON
FRIDAY, JUNE 21st.
GLASGOW
RETURN 25/6 FARE.
Depart 11.15 p.m
An opportunity to visit Scottish Beauty Spots —Kyles and Isles of Bute, Loch Lomond, etc.

CIRCULAR TRIP through
LAKELAND
Return 21/- Fare.
Visiting Keswick, Ambleside, Windermere.
Depart 12.40 night.

Get a complete proper issue of cheap bookings from your local L M S Station or Agency.

SOUTHERN

Why not spend next Week-End Abroad?

CHEAP WEEK-END TICKETS
(Without Passport)
every Friday, Saturday, Sunday to Tuesday from LONDON as under

To	Victoria	Waterloo
PARIS	36/6	34/6*
STAPLES	35/7	—
BOULOGNE	32/6	—
CALAIS	34/6	—
AMIENS	40/8	—
ARRAS (Battle Fields)	43/11	—
YPRES	39/3	—
DIEPPE	32/6	—
OSTEND	36/1	—

*Passports required. *2nd Class.

Ask for Continental Excursions Programme at the CONTINENTAL ENQUIRY OFFICE, Victoria Station, S.W.1 or any Tourist Agency.

NEXT WEEK IS ASCOT WEEK
June 19, 19, 20 and 21.
FREQUENT TRAINS EACH DAY from Waterloo Station between 9 a.m. & 10.15 a.m.
Return 8/- Fare.

To avoid Rail and avoid Road Delays!

After the Races visit the
ALDERSHOT TATTOO!
SPECIAL TRAIN to ALDERSHOT from Waterloo, etc., each evening (June 18, 19, 20, 21 & 22) at Greatly Reduced Fares as under:

From	Dep. p.m.	Cheap Return Fares 3rd Class	Return Tickets from Aldershot to All Stations
Waterloo	7.10	3/-	On Tues., Wed., Thurs. and Friday nights, 12.45 and 1.0 a.m. On Saturday night, a.m. 12 45 1 0 1 25
Clapham Jct.	7.13		
Wimbledon	7.20		
Malden	7.25	2/6	
Surbiton	7.31		
Esher	7.38	2/-	
Walton	7.43	1/6	
Weybridge	7.50		
West Weybridge	7.58	1/3	

SPECIAL RESTAURANT and SUPPER CAR TRAIN from Waterloo each evening at 7.55 p.m. (Sur. Sitton 8.14 p.m.)

1st Class Return Fares (Reservation from Waterloo 7/6, from Surbiton 6/-.

A—5.45 p.m. Sat., June 22.
B—Change at Wimbledon.

For full details of Special Trains see Alder-shot Tattoo Week see Handbill C.R. 1008 at S.R. Stations and Enquiry Offices.

The week's "Star" turn:—
Sports Parties of four or more, by prior arrangement with the Railway Companies, can travel at exceptionally Cheap Rates. Did YOU know this?

WATCH THIS SPACE NEXT WEDNESDAY

From the Railway Gazette (London)

British Railways Advertise Travel Bargains

Reproduction of a newspaper display advertisement of the type which the four railway companies of Great Britain are employing jointly to advertise their special excursion fares and other passenger rate concessions.

Traffic

The effect of the O'Fallon decision on railroad valuation and rate making was discussed by Leslie Craven, counsel of the Presidents' Conference Committee on the Federal Valuation of the Railroads in United States, at a luncheon given by the Traffic Club of Chicago on July 10.

Oral arguments were heard by the Interstate Commerce Commission on July 15 and 16 in the eastern class rate investigation in which the commission examiners have recommended a revision of class rates in eastern territory on a mileage scale basis.

The Union Pacific, assisted by the Kansas State Agricultural College, the Colorado State Agricultural College, the Kansas City (Mo.) Chamber of Commerce and the Southwestern Wheat Improvement Association, will operate an agricultural demonstration train over its lines in Kansas and Colorado, in the interest of encouraging a balanced farm program for dry land territory, from July 29 to August 9. During that period the train will make 18 stops in central and western Kansas and 14 stops in eastern Colorado.

The Gulf Coast Lines have inaugurated a daily freight service for cotton from Rio Grande valley points destined to the ports of Houston, Tex., Corpus Christi and Galveston. Trains will originate at Brownsville, Tex., and at Mission early each night and all cotton, both flat and pressed, loaded during the day will be gathered and moved through Harlingen, Tex., and Raymondville for delivery at Corpus Christi on the following morning. Cars destined for Houston and Galveston will be delivered on the second morning.

North Western Teletype Machines in Freight Offices

The Chicago & North Western has placed a system of Teletype machines in service at five of its freight transfer points in Chicago for the purpose of speeding up the reconsigning of freight. The five machines, which were installed by the Illinois Bell Telephone Company and which operate over that company's circuits connecting the general freight department at 400 West Madison street, the Proviso yards, the Western avenue station at California and Kinzie streets, the Wood street station at Fourteenth street and Western avenue, and the Pacific Fruit Express offices. The machines are primarily for reconsigning freight shipments but they are available also for transmitting other information.

Heavy Grain Loading in Southwest

Of the 52,493 cars loaded with grain and grain products during the week ended July 6, which was an increase of 9,204 cars as compared with the corresponding week of 1928, there were 26,753 cars loaded on six of the principal grain-handling lines in the Texas-Oklahoma-Kansas territory, M. J. Gormley, chairman of the Car Service Division of the American Railway Association, stated on July 17 in a statement on the grain situation in the Southwest.

"All elevators that have been closed," he said, "which was largely due to washout conditions in Kansas, will be opened within 48 hours.

"The railroads mostly affected, the Santa Fe and the Rock Island, have been getting a liberal supply of grain cars under orders of the Car Service Division, approximately 14,000 cars having been delivered those lines. There is considerable grain on the ground, which the best information indicates will remain there during the period that the heavy movement continues from the farms to the country elevators. No attempt is being made to pick this grain off the ground while the movement is continuing in a heavy stream from the farms.

"There are 3500 cars of grain at Galveston. Unloading is slow. 2300 cars are enroute there. There are no accumulations above normal, considering the heavy movement at Kansas City, Hutchinson, Wichita or other interior markets. Excellent work is being done through the cooperation of the grain people with the railroads in speeding up the unloading at all of the interior markets. It is estimated that the peak will be over by the latter part of July."

Express Refrigerator Service Ordered for Strawberries and Dewberries

The Interstate Commerce Commission has issued an order directing carriers which serve shippers of strawberries in Florida, North Carolina and Alabama, and shippers of dewberries in North and South Carolina, to establish on or before December 1 express refrigerator service for carload shipments to destinations in Official Classification territory. The order was issued in connection with a supplemental report made public on July 17. In the original report the commission found that the carriers should arrange for the establishment of such a service and that they were expected to submit plans within 60 days. The supplemental report says that respondents other than the Southern have been unable to formulate a plan and have taken no action to conform with the findings. Express refrigerator carload service is defined to mean such service as will enable the carriers under normal conditions to make delivery of strawberries in carloads at New York, Boston, Buffalo, Pittsburgh, Cleveland, Detroit and Chicago in time for market the third morning from date of consignment when shipped from northern Florida and fourth morning from southern Florida; of strawberries and dewberries in time for market the third morning when shipped from North or South Carolina; and of strawberries from Alabama in time for market the fourth morning at New York and Boston and the third morning at the other cities named.

* * * *

Wide World

New Washington-Boston Service Inaugurated

Ceremonies in connection with initial departure from Washington on July 14 of the "Senator," which now operates between these two cities over the Pennsylvania and the New Haven in 9½ hours.

Foreign Railways

Nineteen Killed in Wreck

Nineteen persons killed and 35 injured is the report of a collision mentioned in press despatches of July 4 as occurring at Plascon, Poland, near Cracow.

Great Western Train Makes 77.25 Miles in 70 Minutes

In connection with its new summer passenger train schedules, which became effective on July 8, the Great Western of Great Britain operates a new fast train between Swindon and Paddington (London), England. The average speed of the train is 66¼ miles per hour as it makes the 77¼ mile run in 70 minutes.

Russian Officers Dismissed from Chinese Eastern

Chinese authorities have dismissed 30 Russian officers of the Chinese Eastern Railway and have taken charge of this 1,000-mile line, which is the central artery of communicaton between the Russian port of Vladivostok through Manchuria and European and Asiatic Russia, via connection with the trans-Siberian Railway, according to recent press reports from Harbin, Manchuria.

The dismissal of the officers was followed by a severance of diplomatic relations with Soviet Russia and was interpreted as an act of retaliation, on the part of China, against communistic propaganda in Manchuria. Although wholly within Chinese territory, the Chinese Eastern had previously been operated jointly by China and Russia.

No Change in British Railway Rates

No changes in the present railway rates of Great Britain were made by the Railway Rates Tribunal following its first annual review of the tariff structure in accordance with the provisions of the Railways Act, 1921.

This act provided for the determination of a standard net revenue for each railway company and for the establishment of rates designed to produce such standard revenues. If the determined rates failed to produce the standard revenues in the first full year of their operation a review was ordered. The new rates became effective on January 1, 1928, and, as pointed out in the *Railway Age* of April 27, page 966, failed by approximately $45,000,000 to produce the standard revenues during the year 1928.

At the hearing the railway companies did not, however, advocate increased rates since, as the report of the Railway Rates Tribunal points out, because of various economic conditions in the country increases were not practicable and might tend to diminish rather than increase earnings. Hence the tribunal after setting forth in its decision, the deficiencies and finding them not due to inefficient management concludes: "That, nothing appearing upon our review which established that under present conditions any modification or modifications would enable the companies to earn their respective standard revenues, no such modifications are necessary and we make none."

Sir Felix J. C. Pole Leaves Great Western of Britain

Sir Felix J. C. Pole, general manager of the Great Western Railway of Great Britain, since July, 1921, retired from that position on July 6 to become chairman of the Associated Electrical Industries, Ltd. This latter is a holding Company which controls British electrical concerns and in which a substantial interest is held by the International General Electric Company.

Sir Felix J. C. Pole first entered the service of the Great Western in the telegraph department in October, 1891, and served in various engineering department positions while at the same time editing the Great Western Railway Magazine in his spare time. When the publication became the official organ of the company in 1904, he was transferred to the general manager's office to assume charge of the magazine. There followed successive promotions until he became general manager in 1921. He served as chairman of the General Managers' Conference of the Railway Clearing House in 1926. Sir Felix will continue with the Great Western in a consulting capacity. He has been succeeded as general manager by James Milne, former assistant general manager,

New Railway in Central Africa Is Opened to Service

Ceremonies in connection with the official opening of the Benguela Railway in Africa, a project begun some 27 years ago and just recently completed through the combined efforts of the British and Portuguese were held on June 10 at the rail head, Lauo, on the frontiers of Portuguese West Africa and the Belgian Congo. Representatives of the governments of Northern and Southern Rhodesia, the Union of South Africa and of the Belgian Congo participated in the program.

The line, already completed, extends a distance of about 838 miles from Lobitobay and Benguela on the West coast of Africa, across Angola to the frontier on the Belgian Congo. The road has as its objectives the completion of a connection with the central, southern and eastern railway systems of Africa, and with the great mineral areas of Northern Rhodesia and Katanga. This will be accomplished when a short line in the Belgian Congo, now under construction, is completed. The road brings a shorter outlet to the fertile plateau region of Central Africa, being 500 miles shorter than the other railroads connecting the district with the Atlantic coast. Its harbor terminal on the Atlantic is only 4,900 miles from Southampton, allowing a saving on shipment of goods of some 2,500 sea miles over other routes. The portion of the Benguela Railway now under construction between Iauo and Tshilongo is at present covered by motor coach service.

Train Speed Tests in Germany

Experimental train speed tests are being made on the German State Railways according to recent reports to the United States Department of Commerce. The purpose of the trials is to test the rolling stock and roadbed under varying speed conditions.

A run was recently made from Hemburg to Nauen, a distance of 251 kilometers (156 miles) with a train comprising 15 cars. This train covered the distance in 2 hrs. 37 min. or at an average speed of 100 kilometers (62 miles) per hour. The fastest regular trains now operating between Hamburg and Berlin cover the 180-mile distance at an average speed of about 55 miles per hour. It is pointed out in connection with the tests that since the "FD" trains have again attained the pre-war maximum speed of 100 kilometers (62 miles) per hour, no increases in speed are contemplated immediately.

Reduced Passenger Rates for British Merchants

British railways, on June 1, inaugurated experimental reduced fares for traveling representatives of business firms which qualify with any one railway company for the concession. The condition for qualification is that the merchandise freight revenue received from the applicant's business be not less than £300 per year.

Any eligible firm may obtain a book of vouchers covering 10,000 miles of travel for use within 12 months from the date of issue. The use of the vouchers is restricted to firm members or employees traveling strictly on business. As the firm's travel requirements arise the vouchers are exchanged for tickets. The reductions amount to 23 per cent from first class fares and 20 per cent on third class tickets. At the time of purchase a deposit of £80 is required for first class fare vouchers and of £50 for third class vouchers. This is payable to the secretary of the Railway Clearing House who advises the participating firms each month as to the value of tickets issued in exchange for the vouchers.

One of the United States Army's largest mobile guns, a 14-in., 50-caliber model on railway mount with a range of 25 miles, is being transported from Aberdeen, Md. to the Benecia arsenal in California by the Pennsylvania, the Chicago & North Western, the Union Pacific and the Southern Pacific. The gun whose total weight, including the rifle and mount exceeds 730,000 lb., left the Aberdeen proving grounds on June 28 and arrived in Chicago on July 3. The special car carrying the gun, consists of a system of four individual trucks with a total of 14 axles. The total height of the unit is 14 ft. 1 in. while the maximum breadth is 10 ft. It is 95 ft. 4 in. in length.

Equipment and Supplies

Locomotives

THE TEXAS & PACIFIC is inquiring for five 4-8-2 type locomotives.

THE BESSEMER & LAKE ERIE has ordered one 2-10-4 type locomotive from the Baldwin Locomotive Works.

THE WABASH has ordered 25 of the 4-8-2 type locomotives from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of June 29.

THE GRENGESBERG, OXLESUND, an ore mining company in Sweden, has ordered two non-condensing turbine locomotives from the Aktiebolaget Ljungstroms Angturbin, Stockholm, Sweden. It is reported that these two locomotives are to be built along the same design as the Ljungstrom condensing locomotives which have been described at various times in the *Railway Age*, with the exception that the condensing feature is to be omitted.

Freight Cars

THE GREAT NORTHERN is inquiring for 300 flat cars.

THE SPOKANE, PORTLAND & SEATTLE is inquiring for five caboose cars.

THE TEXAS COMPANY is now inquiring for 18 gondola cars of 50 tons' capacity.

THE NEWFOUNDLAND RAILWAY is inquiring for 20 gondola cars of thirty tons capacity.

THE CUDAHY PACKING COMPANY is inquiring for 50 steel underframes for freight cars.

THE NEW YORK, NEW HAVEN & HARTFORD is inquiring for 75 coke car bodies of 40 tons' capacity.

JOHN A. ROEBLINGS SONS COMPANY has ordered ten gondola cars. It is reported that the order was placed with the American Car & Foundry Company.

THE INTERNATIONAL HARVESTER COMPANY has ordered 13 hopper cars of 70 tons' capacity from the Pressed Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of June 1.

Iron and Steel

THE PENNSYLVANIA has ordered 550 tons of steel for bridges from the McClintock-Marshall Company.

THE PENNSYLVANIA is inquiring for 14,000 tons of steel for two bridges over the Hackensack river at Marion, N. J.

THE CHESAPEAKE & OHIO has ordered 250 tons of structural steel for a bridge at Miami, Ohio, from the Bethlehem Steel Company.

THE BALTIMORE & OHIO has ordered 500 tons of steel for bridges at Keyser, W. Va., from the McClintock-Marshall Company.

THE GREAT NORTHERN has divided an order for 30,000 tons of rail between the Inland Steel Company, the Illinois Steel Company and the Bethlehem Steel Company.

THE BOSTON & MAINE has ordered 1,000 tons of steel for an office building at Boston, Mass., from the New England Structural Company.

THE BALTIMORE & OHIO has ordered 185 tons of structural steel for a bridge at Chicago from the McClintic-Marshall Company.

THE PERE MARQUETTE has ordered 350 tons of structural steel for miscellaneous bridge work from the American Bridge Company.

THE DELAWARE, LACKAWANNA & WESTERN has ordered from the American Bridge Company 4,000 tons of steel to be used in connection with its electrification work.

THE NORFOLK & WESTERN has placed orders for 41,500 tons of rail divided as follows: United States Steel Corporation, 30,000 tons and Bethlehem Steel Company, 11,500 tons.

Machinery and Tools

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for an axle lathe and several grinders.

THE GRAND TRUNK has ordered, from Manning, Maxwell & Moore, Inc., one 4-ton crane, 60-ft. span and 40-ft. lift.

THE CHESAPEAKE & OHIO has ordered 47 hoists, including 31 of 1-ton capacity and 16 of 2-tons, from the American Engineering Company.

THE LOS ANGELES & SALT LAKE has ordered, from Manning, Maxwell & Moore, Inc., one 90-in. journal turning and quartering and thirding machine.

Supply Trade

J. L. Artmaier resigned as sales manager of the **Buda Company,** Harvey, Ill., on July 1 and is now on an extended leave of absence during which he will take a trip around the world.

Clarence E. Irwin has been appointed St. Louis representative of the railway appliances division of the **American Fork & Hoe Company,** Cleveland, Ohio, with office at 310 Frisco building, St. Louis, Mo.

The American Hoist & Derrick Company, St. Paul, Minn., has moved its office at San Francisco, Cal., from that city to 5515 Doyle avenue, Oakland, Cal. **Boyd Nixon,** who was in charge of the San Francisco office is in charge of the Oakland office.

The Fusion Welding Corporation is now owned outright by the **Chicago Steel & Wire Company,** 103rd street and Torrence avenue, Chicago. The same personnel is in charge; the Fusion Welding Corporation has taken over the sale of all welding rod manufactured by the parent company; this provides one source of supply for welding equipment and accessories previously sold by the two companies.

W. R. Carnegie, vice-president and general manager of **Berry Brothers, Inc.,** Detroit, Mich., has been elected president and general manager. Mr. Carnegie joined the organization in 1895. He was treasurer for 25 years before taking up his present duties as general manager. **F. L. Colby,** who was president, has been promoted to chairman of the board of directors. **John C. Witherspoon,** for many years a member of the board of directors, has been elected vice-president. The board has been increased two members, **H. L. Stanton,** and **Joseph Berry Sherrard,** grandson of Joseph H. Berry, one of the founders, are the new members.

The Yale & Towne Manufacturing Company, Stamford, Conn., has contracted to purchase the assets and goodwill of the **Stuebing Cowan Company,** Cincinnati, Ohio, and Holyoke, Mass., makers of hand lift trucks. The sales of the Yale & Towne entire line of material handling devices will continue to be under the supervision of **James C. Morgan,** and arrangements have been made under which the executive personnel of the Stuebing Cowan Company will enter the services of the Yale & Towne Company. **Walter C. Stuebing** will act as assistant to Mr. Morgan, in charge of all truck sales, and **William Stuebing** will continue to act as superintendent of the plant in Cincinnati. A large modern factory for the manufacture of hand lift trucks and skid platforms is in process of construction in Cincinnati.

Obituary

John S. Turner, who served for the past 25 years in the sales department of the Pressed Steel Car Company, died on July 15. Mr. Turner was born at Reading, Pa., on March 9, 1859. He entered the employ of the Cumberland & Pennsylvania as a machinist's apprentice in September 1875, and four years later went to the Pennsylvania in the Altoona shops, where he worked

in various capacities until January, 1884, when he was appointed assistant road foreman of engines. The following November he went to the Mexican Central (now part of the National Railways of Mexico) as master mechanic. In February, 1887, he entered the service of the New York Air Brake Company as special representative and spent two years in Spain supervising application of vacuum brakes. He returned to the Mexican Central in November, 1891, as master mechanic. One year later he entered the employ of the Mexican International (now part of the National Railways of Mexico) as assistant superintendent of motive power. In April, 1894, he went with the West Virginia Central & Pittsburgh (now part of the Western Maryland) as superintendent of motive power. and subsequently served in the same capacity successively on the Colorado & Southern, the Fitchburg Railroad (now part of the Boston & Maine) and then on the Toledo, St. Louis & Western (now part of the New York, Chicago & St. Louis) as superintendent of motive power and equipment. Mr. Turner entered the employ of the Standard Coupler Company in December, 1901, as special representative, where he remained until September 15, 1904, and since that time had served in the sales department of the Pressed Steel Car Company.

Trade Publications

TWO-PIECE RETAINING WALL. — The Federal Cement Tile Company, Chicago, has issued a 16-page bulletin describing and illustrating a variety of applications of the Federal concrete cribbing. In addition to photographs and descriptions of installations, detailed drawings are included which show the dimensions necessary for the application of this type of construction to any particular purpose.

MULTIPLE VALVE THROTTLE—A series of six reasons why multiple valves are used in American multiple throttles are given in Bulletin 4, entitled "Why a Multiple Valve Throttle?", issued by the American Throttle Company, 17 East Forty-Second street, New York. A front end view of a locomotive shows the American multiple throttle, superheater and steam pipes in place. A perspective view points out the location of the various parts of the throttle and superheater header.

LOCOMOTIVE SUPERHEATER. — "A short Story of the Locomotive Superheater," issued by the Superheater Company, 17 East Forty-Second street, New York, contains a brief history of the development of the application of superheated steam to locomotives from the earliest experiments to present-day practice, with special reference to the history of the Elesco superheater on American railroads. This is followed by a statement of how the superheater improves locomotive operation, brief descriptions of Elesco Type A and Type E superheaters, with illustrations of the principal parts, and a statement regarding the general care of a locomotive superheater.

Construction

ALGOMA EASTERN.—A contract for the construction of an extension to the coal dock and storage facilities at Turner, Ont., has been let to the Ralph MacDonald Paving Company at a cost of $150,000.

BOSTON & MAINE.—A final contract covering the design and construction of a 16-story, 500-room hotel in connection with the New North Station project, at Boston, Mass., by this company and the Manger hotel interests of New York, was announced on July 15, subject to the final approval by the Massachusetts Department of Public Utilities of modifications in financing details. The contract calls for an early start on erection, using the foundations and steel framework which were installed on the west wing of the North Station for a restaurant prior to the development of the hotel project. The cost will be approximately $2,800,000. The original announcement and other details concerning the new building were published in the *Railway Age* issue of March 9.

CANADIAN NATIONAL-CANADIAN PACIFIC. —The general contract for the construction of a concrete subway, 1,300 ft. long, under tracks of these companies on Ray avenue, Toronto, Ont., has been let to the Dufferin Paving & Crushed Stone Company, Toronto, at a cost of about $145,000.

CHESAPEAKE & OHIO.—This company has authorized construction of new engine terminal facilities at Elk, W. Va., at an approximate expenditure of $47,000.

CANADIAN PACIFIC.—A contract has been let to Foley Brothers, Ltd., Winnipeg, Man., for the grading of the first 45 miles of the line to be constructed between Lanigan, Sask., and Prince Albert. The contract for grading of the second half of the line from M. P. 45 to M. P. 91 at Birch Hills, Sask., near Prince Albert, has been let to Stewart & Cameron, Winnipeg.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—A contract has been let to John Marsch, Chicago, for the construction of a double track cut-off at Sioux City, Iowa, between the passenger station in that city and a point on the present main line near Brughier Bridge, 2.5 miles. The new line will be constructed through an undeveloped section, where it will be unnecessary to cross any streets or highways. The old main line crossed sixteen streets at grade and included a one per cent grade. The project involves the excavation of about 100,000 cu. yds. of earth and the expenditure of $150,000.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract has been let to Arthur H. Neumann & Company, Des Moines, Ia., for the construction of a new service building and passenger station platform canopies and the remodeling of the existing passenger station at Des Moines.

DELAWARE, LACKAWANNA & WESTERN.—This company has awarded a contract to the Turner Construction Company, New York, for the construction of a new coal trestle and yard at Twenty-fifth street in South Brooklyn, N. Y. The construction of a new storehouse at Harrison, N. J., in connection with this company's electrification project has been authorized.

ESQUIMALT & NANAIMO.—This company plans during 1929, the replacement of 40 wood-box culverts on the Victoria and Lake Cowichan subdivision with ingot iron culverts. At Nanoose, B. C., it is planned to construct a siding 1,200 ft. long.

GREAT NORTHERN.—A contract for the construction of an eight-stall brick addition to the roundhouse at Havre, Mont., has been awarded to the Industrial Contracting Company, St. Paul, Minn. The total cost of this project, including a 120-ft. turntable will be about $125,000.

LEHIGH & NEW ENGLAND.—This company has awarded a contract to L. H. Blouch & Company, Philadelphia, Pa., for the construction of six monolithic reinforced concrete storage silos, together with hoist house, hoisting machinery and equipment for the retailing of anthracite coal at Allentown, Pa. The silos will have a total storage capacity of 2,100 tons. The total cost of the project, including office building, scales, driveways, and railway siding, which are not included in the main contract, has been estimated at $65,000.

MISSOURI PACIFIC.—A contract has been let to Arthur & Allen, Pueblo, Colo., for the construction of an ice house and dock at Ordway, Colo., at a cost of about $50,000.

NEW YORK CENTRAL.—The New York Public Service Commission has approved the revised plans and estimates of cost for the reconstruction of the bridge carrying this company's tracks over a state highway in the town of Salina, N. Y. The cost of the project, which is to be done by the Department of Public Works, has been estimated at $152,000.

NEW YORK CENTRAL.—Specifications and estimates of cost totaling $248,400, exclusive of land and damages, for the elimination of a grade crossing of this company's tracks and Harlem avenue, in Cheektowaga, Erie county, N. Y., as submitted by the railroad company have been approved by an order of the New York Public Service Commission. The specifications, likewise approved by the Department of Public Works, are substantially in accordance with the Commission's order.

NEW YORK CENTRAL.—This company has awarded contracts as follows: to the Walsh Construction Company, Syracuse, N. Y., for the construction of a new sewer system and a connection to the

existing sewer at Harmon, N. Y.; to the Electric Storage Battery Company, Philadelphia, Pa., for work in removing storage batteries from its sub-station at Fiftieth street and re-installation at Forty-third street, New York; to the Turner Construction Company, New York, for the construction of garage and other work on West End avenue between Sixty-fifth and Sixty-sixth streets, New York; to the Wilson & Englis Construction Company, New York, for the construction of a spur to the mill of the St. Joseph Lead Company in Emeryville, N. Y.; to J. H. Merritt & Company, New York, for heating equipment and piping at its engine terminal at Rensselaer, N. Y.

NEW YORK, NEW HAVEN & HARTFORD.—This company has awarded contracts for the construction of a new freight house 20 ft. by 50 ft. with a platform 10 ft. by 200 ft. and for the laying of tracks and the installation of driveways to replace facilities at Mattapan (Boston), Mass., recently sold to the City of Boston, and estimated to cost about $50,000. A contract for the freight house, platforms and driveways has been given to the Simpson Brothers, Inc., Boston, and the other for the grading operations and the construction of a concrete crib wall has been awarded to John W. Pearson, Boston, Mass.

NORTHERN PACIFIC.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a branch line from Woodrow to Bloomfield, Mont., 24 miles.

PENNSYLVANIA.—This company plans the construction of a new passenger station with outside dimensions of 80 ft. by 41 ft., at Gary, Ind., at a cost of about $75,000.

PENNSYLVANIA—PITTSBURGH, SHAWMUT & NORTHERN.—The New York Public Service Commission approved the plans and specifications for work in connection with the reconstruction of a bridge over the lines of these two roads in Olean, N. Y., at an estimated cost of $33,460.

PENNSYLVANIA.—This company has awarded contracts for construction work on its lines amounting to a total expenditure of $958,000 as follows: To W. F. Trimble & Sons Company, Pittsburgh, Pa., for the completion of inbound and outbound freight houses and platforms above foundations at Eleventh and Etna streets, Pittsburgh, $700,000; to the Stevens Construction Company, Cleveland, O., for the construction of a retaining wall along the east bank of the Mahoning river at Girard, O., $90,000; to Ferguson & Edmondson, Pittsburgh, Pa., for drainage improvements at Fairplay O., and Uhrichsville, $71,000; to the Rust Engineering Company, Pittsburgh, Pa., for the dismantling and disposing of present overhead bridges and the erection of new bridges on its lines at North and Irwin avenues, Pittsburgh, Pa., $46,000; to T. J. Foley Company Pittsburgh, Pa., for drainage improvements at Raccoon, Pa., $31,000, and to Sinclair & Grigg, Philadelphia, Pa., for the erection of a new hump building in the South Philadelphia terminal yard Philadelphia, Pa., $20,000.

RUTLAND.—A contract has been awarded to the Phonix Bridge Company for the reconstruction of a bridge on this company's lines in Leicester Junction, Vt., at an estimated cost of $35,000.

WESTERN PACIFIC.—The Interstate Commerce Commission has denied the application of the Sacramento Northern, an electrically operated subsidiary of this company, for authority to construct an extension to its Holland line from a point near its southern end and southward 7.8 miles to Ryde, Cal.

* * * *

Wide World

The Old and the New

A replica of "The Rocket," compared with a modern locomotive. This likeness of the locomotive of 100 years ago was built in England for the Henry Ford Museum at Detroit, Mich., by Robert Stephenson & Co., builders of the original "Rocket."

Financial

ATLANTIC COAST LINE.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Yuste to Monticello, Fla., 4.8 miles.

BALTIMORE & OHIO.—*Trackage Rights.*—The Interstate Commerce Commission has authorized the Pennsylvania and the Norfolk & Western to operate under trackage rights over the line of the B. & O. in Hamilton county, Ohio, approximately 7 miles.

CHICAGO, MILWAUKEE, ST PAUL & PACIFIC.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Eagle to Troy Center, Wis., 5 miles, and the line from Worthington to Farley, Ia., 6.8 miles.

CINCINNATI NORTHERN.—*Annual report.*—The annual report of this company for 1928 shows net income after interest and other charges of $594,927, as compared with net income in 1927 of $732,105. Selected items from the income statement follow:

CINCINNATI NORTHERN

	1928	1927	Decrease
RAILWAY OPERATING REVENUES	4,061,793	4,636,369	—574,576
Maintenance of way	497,340	561,914	— 64,573
Maintenance of Equipment	825,980	900,283	— 74,303
Transportation	1,351,608	1,482,730	—131,122
TOTAL OPERATING EXPENSES	2,874,043	3,153,644	—279,601
Operating ratio	70.76	68.02	2.74
NET REVENUE FROM OPERATIONS	1,187,750	1,482,725	—294,975
Railway tax accruals	271,687	344,804	— 73,117
Railway operating income	914,869	1,137,433	—222,564
Equipment rents Net Cr.	40,291	Dr.—8,837	49,129
Joint facility rents — Net Dr.	284,869	331,777	— 46,909
NET RAILWAY OPERATING INCOME	670,291	796,818	—126,527
Non-operating income	23,259	46,247	— 22,988
GROSS INCOME	693,550	843,065	—149,514
Interest on funded debt	91,667	96,866	— 5,199
TOTAL DEDUCTIONS FROM GROSS INCOME	98,624	110,960	— 12,337
NET INCOME	594,927	732,105	—137,178
Disposition of net income			
Dividends declared (10 per cent each year)	300,000	300,000	
Surplus for year carried to profit and loss	294,927	432,105	—137,178

DENVER & RIO GRANDE WESTERN—*Notes.*—The Interstate Commerce Commisssion has authorized this company to issue $240,000 of promissory notes to bear interest at 5 per cent and to mature in

(Continued on page 226)

Annual Report

The Cleveland, Cincinnati, Chicago & St. Louis Railway Company

To the Stockholders of

THE CLEVELAND CINCINNATI CHICAGO AND ST. LOUIS RAILWAY COMPANY:

The Board of Directors herewith submits its report for the year ended December 31, 1928, with statements showing the income account and the financial condition of the company.

The Year's Business

The company moved 44,820,712 tons of revenue freight during the year, a decrease of 775,129 tons as compared with 1927. Freight originating on the road increased 1,458,701 tons, while there was a decline in freight received from connecting carriers of 2,233,830 tons.

Revenue passengers carried were 3,595,203, a decrease of 453,194, of which 65,254 were interline, 386,871 local and 1,069 commutation.

The general decline in passenger traffic is due to the increasing use of privately owned motor cars and motor bus competition. While at first bus competition was confined to short haul traffic, it is now an important factor between cities one hundred to three hundred miles apart.

Income Account for the Year

	Year ended Dec. 31, 1928	Year ended Dec. 31, 1927	+ Increase — Decrease
OPERATING INCOME	2,397.25 *miles operated*	2,396.52 *miles operated*	+.73 mile
RAILWAY OPERATIONS			
Railway operating revenues	$88,830,152.40	$91,185,736.88	—$2,355,584.48
Railway operating expenses	66,989,154.90	70,322,698.77	— 3,333,543.87
NET REVENUE FROM RAILWAY OPERATIONS	$21,840,997.50	$20,863,038.11	+ $977,959.39
Percentage of expenses to revenues	(75.41)	(77.12)	— (1.71)
Railway tax accruals	$4,928,865.04	$5,047,015.35	— $118,150.31
Uncollectible railway revenues	16,208.37	15,462.22	+ 746.15
RAILWAY OPERATING INCOME	$16,895,924.09	$15,800,560.54	+$1,095,363.55
Equipment rents, net debit	$847,294.35	$501,462.05	+ $345,832.30
Joint facility rents, net debit	426,092.15	696,031.59	— 269,939.44
NET RAILWAY OPERATING INCOME	$15,622,537.59	$14,603,066.90	+$1,019,470.69
MISCELLANEOUS OPERATIONS			
Revenues	$12,509.03	$10,725.49	+ $1,783.54
Expenses and taxes	17,254.63	16,395.03	+ 859.60
MISCELLANEOUS OPERATING DEFICIT	$4,745.60	$5,669.54	— $923.94
TOTAL OPERATING INCOME	$15,617,791.99	$14,597,397.36	+$1,020,394.63
NON-OPERATING INCOME			
Miscellaneous rent income	$289,191.29	$284,566.30	+ $4,624.99
Miscellaneous non-operating physical property	163,000.90	174,027.41	— 11,026.51
Dividend income	387,656.40	1,485,308.90	— 1,097,652.50
Income from funded securities	551,579.19	436,217.47	+ 115,361.72
Income from unfunded securities and accounts	556,338.59	307,070.13	+ 249,268.46
Release of premiums on funded debt	223.15	379.80	— 156.65
Miscellaneous income	23,942.88	27,245.39	— 3,302.51
TOTAL NON-OPERATING INCOME	$1,971,932.40	$2,714,815.40	— $742,883.00
GROSS INCOME	$17,589,724.39	$17,312,212.76	+ $277,511.63
DEDUCTIONS FROM GROSS INCOME			
Rent for leased roads	$417,510.71	$583,318.13	— $165,807.42
Miscellaneous rents	198,272.67	198,875.38	— 602.71
Miscellaneous tax accruals	75,050.00	27,000.00	+ 48,050.00
Separately operated properties —loss	92,224.27	668.22	+ 91,556.05
Interest on funded debt	7,697,785.93	7,426,958.83	+ 270,827.10
Interest on unfunded debt	18,343.31	22,169.79	— 3,826.48
Amortization of discount on funded debt	252,400.18	259,578.42	— 7,178.24
Maintenance of investment organization	$27.57	831.99	— 304.42
Miscellaneous income charges	17,786.58	17,429.69	+ 356.89
TOTAL DEDUCTIONS FROM GROSS INCOME	$8,769,901.22	$8,536,830.45	+ $233,070.77
NET INCOME	$8,819,823.17	$8,775,382.31	+ $44,440.86

	Year ended Dec. 31, 1928	Year ended Dec. 31, 1927	+ Increase — Decrease
DISPOSITION OF NET INCOME			
Dividends declared			
On preferred stock, 5 per cent each year	$499,925.00	$499,925.00	
On common stock, 8 per cent in 1928; 7¾ per cent in 1927	3,762,304.00	3,644,724.25	+ $117,579.75
Sinking funds	51,700.44	49,568.55	+ 2,131.89
TOTAL APPROPRIATIONS OF INCOME	$4,313,929.44	$4,194,217.80	+ $119,711.64
SURPLUS FOR THE YEAR CARRIED TO PROFIT AND LOSS	$4,505,893.73	$4,581,164.51	— $75,270.78

Profit and Loss Account

BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1927		$55,864,944.96
ADDITIONS:		
Surplus for the year 1928	$4,505,893.73	
Profit on sale of land	11,954.34	
Unrefundable overcharges	11,655.16	
Donations in aid of side track construction	48,286.11	
Unclaimed wages and pensions—year 1922	11,994.45	
Reacquirement of securities below par	5,348.30	4,595,132.09
		$60,460,077.05
DEDUCTIONS:		
Surplus appropriated for investment in physical property	$197,760.61	
Depreciation prior to July 1, 1907, on equipment retired during year	119,093.74	
Loss on property retired	190,729.24	
Amount previously carried as advances to Central Indiana Railway Company including interest	259,225.95	
Uncollectible accounts and miscellaneous items (net)	7,400.67	774,210.21
BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1928		$59,685,866.84

Operating Revenues

The total operating revenues were $88,830,152.40, a decrease of $2,355,584.48.

Freight revenue was $67,594,293.43, a decrease of $385,587.60. Fluctuations in tons carried by principal groups were:

Products of agriculture	317,978 increase	= 12.11%
Animals and products	31,073 increase	= 3.97%
Products of mines	1,717,403 decrease	= 5.62%
Products of forests	23,045 decrease	= 1.27%
Manufactures and miscellaneous	556,282 increase	= 6.53%
Less than carload freight	59,986 increase	= 4.64%
Total	775,129 decrease	= 1.70%

Passenger revenue was $14,558,356.23, a decrease of $1,011,870.59. This decrease in revenue divides as follows:

Interline passengers decrease	$187,408.11
Local passengers decrease	825,469.44
Commutation passengers increase	1,006.96

The average distance traveled by revenue passengers was 121.7 miles, almost double the average of ten years ago.

Mail revenue was $1,877,055.06, an increase of $100,196.31, the result of an increase in rates of approximately 15 per cent effective August 1, 1928.

Express revenue was $2,560,766.93, an increase of $186,245.45, due to increased business.

Other transportation and incidental and joint facility revenues were $2,239,680.75, a decrease of $1,244,568.05, largely attributable to an adjustment under a new operating agreement of joint facility accounting with the Louisville and Jeffersonville Bridge and Railroad Company under which all revenues collected from January, 1927, to November, 1928, were refunded to the Louisville and Jeffersonville Company, all of the capital stock of which is now owned by this company.

Operating Expenses

Operating expenses, by groups, were as follows:

	Amount	Increase	Decrease
Maintenance of way and structures	$9,891,192.14		$1,211,856.67
Maintenance of equipment	19,053,537.35		285,165.10
Traffic	1,833,195.74	$84,286.61	
Transportation	32,468,433.33		1,483,965.70
Miscellaneous operations	1,020,381.44	51,842.56	
General	2,792,815.54		479,351.11
Transportation for investment—credit	70,400.64		9,334.46
Total	$66,989,154.90		$3,333,543.87

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The decrease in expense for maintenance of way and structures is mainly in track work, there having been approximately 40,000 less ties and approximately 16,000 less tons of rail applied.

The principal item contributing to the decrease in expense for maintenance of equipment was locomotive repairs, the outlay per locomotive and the number receiving repairs having been less in 1928 than in the previous year.

The increase in traffic expenses is due largely to the development of the company's representation in outside territory.

The decrease in transportation expenses is found principally in charges for fuel, as to which there was a decrease both in consumption and price, and in payments to the Louisville and Jeffersonville Bridge and Railroad Company incident to adjustments to conform to the terms of the new operating agreement.

General expenses decreased $479,351.11. Commencing with 1925 the company has each year charged to expenses and set up in a reserve an amount to provide for estimated total payments upon pensions granted in that year. Pursuant to recently issued instructions of the Interstate Commerce Commission, however, this practice has been discontinued and the pension expenses for the year 1928 include only the actual payments for pensions applicable to that year and prior to 1925, no charges for a reserve having been made. This has produced a decrease of $476,227.53 in pension charges as compared with 1927.

Changes in Funded Debt

The amount on December 31, 1927 has been increased as follows:		$153,137,197.14
C C C & St L Ry Co refunding and improvement mortgage bonds, 4½%, Series E, due July 1, 1977..	15,000,000.00	
	$168,137,197.14	
and reduced by:		
Bonds retired or purchased for sinking fund during the year:		
C I St L & C Ry Co general first mortgage bonds purchased and cancelled..	$6,000.00	
C I St L & C Ry Co general first mortgage bonds retired through sinking fund	60,000.00	
C C C & St L Ry Co (St Louis Division) first collateral trust mortgage bonds purchased for sinking fund.....	55,000.00	
Payments falling due during the year on the company's liability for principal installments under equipment trust agreements as follows:		
Big Four Railway Trust of 1914, June 1, 1928	373,000.00	
Big Four Railway Trust of 1915, July 1, 1928	115,000.00	
Equipment Trust No. 44 (1920), January 15, 1928	346,700.00	
N Y C R R Co Trust of 1920, April 15, 1928	761,111.40	
N Y C Lines Trust of 1922, June 1, 1928	375,000.00	
N Y C Lines 4½ per cent Trust of 1922, September 1, 1928.....	224,000.00	
N Y C Lines Trust of 1923, June 1, 1928	62,000.00	
N Y C Lines Trust of 1924, June 1, 1928	427,000.00	
N Y C Lines 4½ per cent Trust of 1924, September 15, 1928.....	376,000.00	
N Y C Lines 4½ per cent Trust of 1925, May 15, 1928	532,000.00	3,712,811.40
leaving the funded debt on December 31, 1928		$164,424,385.74

a net increase of $11,287,188.60.

The Peoria and Eastern Railway Company

The balance due to this company by The Peoria and Eastern Railway Company on operating account on December 31, 1927, was $1,237,681.23. This balance was reduced by $17,112.33 in 1928, leaving a net balance due December 31, 1928, of $1,220,568.90.

Proposed Lease of the Company's Properties, Including Transfer of Its Proposed Leases of The Cincinnati Northern and the Evansville Indianapolis & Terre Haute, to The New York Central Railroad Company

The proceedings before the Interstate Commerce Commission in which the authority of the Commission is being sought by this company for the leasing of the Cincinnati Northern Railroad and the Evansville Indianapolis & Terre Haute Railway and by The New York Central Railroad Company for the leasing of the lines of railroad and properties of this company (including assignment of the proposed leases by this company of the lines above mentioned), as more fully set forth in the Annual Report for 1926, are still pending. Additional evidence was introduced at hearings held January 9-16, 1928.

The Board wishes to express its appreciation of the loyal and efficient service of the officers and employees of the company during the year.

For the Board of Directors,
P. E. CROWLEY, *President.*

[ADVERTISEMENT]

Financial News

(*Continued from page 224*)

semi-annual installments of $24,000 each The notes will be made payable to the order of the Baldwin Locomotive Works as part payment for four 4-8-4 type locomotives.

DETROIT, TOLEDO & IRONTON.—*Abandonment.*—The Interstate Commerce Commission has authorized this company and the Toledo & Detroit to abandon a line of the latter company from its intersection with the Dundee branch of the New York Central in Summerfield township, Mich., to its intersection with the Detroit & Ironton near Petersburg, 7 miles.

LONG ISLAND.—*Increase in Capital Stock.*—This company has filed a certificate with the secretary of state of the State of New York increasing the amount of its capital stock from $40,000,000 to $55,000,000.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon and remove 32.31 miles of line in Minnesota, between Darina, Rossburg, Aitkin and Ironhub, and between Ironhub and Manganese.

NEW YORK, CHICAGO & ST. LOUIS.—*Equipment Trust Certificates.*—The Interstate Commerce Commission has authorized this company to issue $2,400,000 of 4½ per cent equipment trust certificates, to be sold at not less than 95.77 per cent of par and interest.

PHILADELPHIA, BALTIMORE & WASHINGTON.—*Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $7,479,000 of general mortgage bonds, to be delivered to the Pennsylvania in partial reimbursement for advances, and to be guaranteed by the Pennsylvania.

PITTSBURGH & LAKE ERIE.—*Annual Report.*—The annual report of this company for 1928 shows net income after interest and other charges of $7,171,890, as compared with net income in 1927 of $6,611,809. Selected items from the income statement follow:

PITTSBURGH & LAKE ERIE	1928	1927	Increase or Decrease
RAILWAY OPERATING REVENUES	31,406,816	31,785,820	—379,004
Maintenance of way	4,235,852	4,576,894	—341,042
Maintenance of equipment	9,903,424	9,936,360	— 32,936
Transportation	10,137,409	10,442,720	—305,311
TOTAL OPERATING EXPENSES	25,602,990	26,320,312	—717,323
Operating ratio	81.52	82.81	— 1.29
NET REVENUE FROM OPERATIONS	5,803,826	5,465,508	338,319
Railway tax accruals	2,038,877	2,004,955	33,922
Railway operating income	3,763,044	3,460,148	302,896
Equipment rents —Net credit	4,061,015	4,620,608	—559,593
Joint facility rents — Net debit	53,230	75,462	— 22,232
NET RAILWAY OPERATING INCOME	7,770,829	8,005,294	—234,465
Non-operating income	1,120,268	1,158,867	— 38,600
GROSS INCOME	8,891,097	9,164,162	—273,065
Rent for leased roads	622,943	739,225	—116,282
Interest on funded debt.	171,127	433,073	—261,946
TOTAL DEDUCTIONS FROM GROSS INCOME	1,719,206	2,552,353	—833,146
NET INCOME	7,171,890	6,611,809	560,081
Disposition of net income:			
Dividends declared, 10 per cent each year	4,318,210	3,958,255	359,955
Surplus for year carried to profit and loss	2,853,680	2,653,554	200,126

SEABOARD AIR LINE.—*Reorganization.*—The last day when adjustment bonds of this company were acceptable for deposit under the reorganization plan was July 15. Approximately three-fifths of the outstanding $25,000,000 of these bonds were deposited, but the company and the adjustment bondholders' committee are not obligated to declare the plan operative unless substantially all of these bonds are deposited. A further appeal for the de-

posit of these bonds has been issued and the date has been extended to July 31. It is announced that a substantial majority of common and preferred stockholders have indicated their approval of the plan and the meeting of stockholders has been adjourned until August 2, to await the outcome of the new appeal for the deposit of the adjustment bonds.

WHEELING & LAKE ERIE.—*Time for Disposition of Stock Extended.*—The Interstate Commerce Commission on July 13 announced that on July 10 it had granted a further postponement of the effective date of its order of March 11 which directed the Baltimore & Ohio, the New York Central and the New York, Chicago & St. Louis to divest themselves of their stock in the Wheeling & Lake Erie within 90 days. The B. & O. and New York Central had disposed of their stock to the Alleghany Corporation and the Nickel Plate asked for a stay of the order as to it, also asking authority to acquire control of the W. & L. E. by purchasing the stock held by the Alleghany Corporation. When the 90 days expired a month ago the commission amended its order to extend the time to 120 days and when that period expired on July 10 it amended its order to provide for 150 days. It is reported that a plan for trusteeing the stock pending a decision by the commission as to the allocation of the Wheeling & Lake Erie is being worked out.

Dividends Declared

Connecticut & Passumpsic Rivers.—3 per cent, payable August 1 to holders of record July 1.

Hudson & Manhattan.—Preferred, 2½ per cent, semi-annually, payable August 15 to holders of record August 1.

Massawippi Valley.—3 per cent, payable August 1 to holders of record July 1.

Mine Hill & Schuylkill Haven.—$1.50, payable August 1 to holders of record July 12 to July 31.

Nashville, Chattanooga & St. Louis.—3½ per cent, semi-annually, payable August 1 to holders of record July 20.

Average Prices of Stocks and of Bonds

	July 16	Last week	Last year
Average price of 20 representative railway stocks.	155.61	147.78	116.04
Average price of 20 representative railway bonds..	90.14	90.44	92.92

* * *

A Monon Passenger Train Near Chicago

Railway Officers

Executive

B. O. Johnson, assistant to the president of the Northern Pacific, has been appointed assistant to the operating vice-president, with headquarters as before at St. Paul, Minn. The position of assistant to the president has been abolished.

E. J. Gurski, secretary to the vice-president and general manager of the Midland Continental, has been appointed assistant to the president, with headquarters at Jamestown, N. D., succeeding **Henry S. Stebbins,** deceased, who held the title of vice-president and general manager.

Walter S. Franklin, general superintendent of the Northwestern division of the Western region of the Pennsylvania, with headquarters at Chicago, has been elected president of the Detroit, Toledo & Ironton, with headquarters at Detroit, Mich. Mr. Franklin succeeds **S. P. Ruddiman,** who on July 16 became vice-president, with headquarters at the same point. A sketch of Mr. Franklin's railway career, together with a reproduction of his photograph, appeared in the *Railway Age* of June 29, page 1622.

D. W. Pontius, vice-president and general manager of the Pacific Electric, a subsidiary of the Southern Pacific has been elected president, with headquarters as before at Los Angeles Cal., succeeding **Paul Shoup,** who is also president of the Southern Pacific. **A. T. Mercier,** president and general manager of the San Diego & Arizona, with headquarters at San Diego, Cal., has been elected vice-president and general manager of the Pacific Electric, to succeed Mr. Pontius. **F. L. Annable,** general superintendent of the Pacific Electric, with headquarters at San Francisco, has been elected president of the San Diego & Arizona, succeeding Mr. Mercier.

George H. Burgess, who has been appointed president of the Tennessee, Alabama & Georgia, was born in Oshkosh, Wis., on June 19, 1874. He was educated at the University of Wisconsin, entering railway service as rodman on the Pennsylvania, Lines West of Pittsburgh, in 1896. He then served successively to 1901 as assistant bridge inspector, bridge inspector and assistant engineer of the same road. On the latter date he entered the service of the Erie at New York as assistant engineer, remaining in that position until 1905, when he was appointed engineer of terminal improvements. The following year he became principal assistant engineer of the same road. Mr. Burgess was appointed chief engineer of the Delaware & Hudson and its subsidiary companies, in 1908, and in May of the following year he was appointed chairman of the valuation committee, serving in that capacity until November, 1913. From the latter date until July, 1925, Mr. Burgess served as real estate agent, then leaving railroad work to become associated with the firm of Coverdale & Colpitts, consulting engineers, located in New York, with which company he was connected at the time of his appointment to the presidency of the Tennessee, Alabama & Georgia.

Financial, Legal and Accounting

The position of general counsel of the Seaboard Air Line at Norfolk, Va., has been re-established, effective July 1, and **W. R. C. Cocke** has been appointed to that position.

Daniel J. Duane, of whom a biographical sketch appeared in the July 6 issue of the *Railway Age,* Page 132, in connection with his appointment to the position of auditor of disbursements of the Louisville & Nashville, was born in Louisville, Ky., on November 6, 1887, and entered the service of the Louisville & Nashville in the office of the auditor of disbursements on August 22, 1904. The dates of his birth and entrance into the service of the Louisville & Nashville were incorrectly given in the notice published in the July 6 issue.

Operating

O. M. Dawson, roadmaster of the Norfolk & Western at Buena Vista, Va., has been appointed assistant superintendent of the Shenandoah division, with headquarters at Roanoke, Va.

The headquarters of the Rio Grande division of the Atchison, Topeka & Santa Fe, of which **B. A. West** is superintendent, have been removed from San Marcial, N. M., to Albuquerque.

S. H. Fulkerson has been appointed assistant superintendent of the Mobile and Montgomery division of the Louisville and Nashville, with headquarters at Montgomery, Ala., succeeding **H. E. Starks,** who has been assigned to other duties.

O. C. Becker, general yardmaster on the Pennsylvania at Cleveland, Ohio, has been promoted to assistant trainmaster on the Buffalo division. **J. A. Markell,** assistant trainmaster on the Allegheny division, retired from active service under the pension rules of the company on June 1.

Wade E. Haist, who has been promoted to superintendent of the Beardstown division of the Chicago, Burlington & Quincy, with headquarters at

Beardstown, Ill., has been in the service of that railway for 27 years. He was born on November 19, 1888, at Table Grove, Ill., and after graduating from high school began his railway career on the Beardstown division of the Burlington. Among the positions in the operating department of the Burlington which he has held are those of trainmaster at Ottumwa, Iowa, and at Burlington and transportation assistant on the Lines West of the Missouri River at Omaha, Neb. Mr. Haist's promotion to superintendent of the Beardstown division became effective on June 25.

E. H. Shaufler, general manager of the Kansas City, Mexico & Orient, and the Kansas City, Mexico & Orient of Texas, has been appointed assistant to the general manager of the Western lines of the Atchison, Topeka & Santa Fe and the Panhandle & Santa Fe, with headquarters at Wichita, Kan., and on August 1 the position of general manager of the Orient lines in the United States will be abolished. **R. L. Davis,** superintendent of the Orient, with headquarters at Wichita, has been appointed assistant superintendent of the Panhandle division of the Santa Fe, with headquarters at the same point. **A. J. Cleary,** superintendent of the Orient in Texas, has been appointed assistant superintendent of the Slaton division of the Panhandle & Santa Fe, with headquarters as before at San Angelo, Tex. Each of these appointments is effective August 1.

Carl R. Gray, Jr., who has been appointed general manager of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., first entered railway service 18 years ago as a yard clerk on the St. Louis-San Fran-

Carl R. Gray, Jr.

cisco. He was born on April 14, 1884, at Wichita, Kan., and graduated from the University of Illinois in 1911 with the degree of bachelor of arts in railroad administration. In addition to his service as a yard clerk at St. Louis, Mo., Mr. Gray was also a car order clerk and terminal trainmaster on the Frisco at that point during 1911. In the same year he became principal engineer of construction on the Oregon Electric and the Spokane, Portland & Seattle and from that time until 1917 he served successively as trainmaster and superintendent on those two roads, as assistant to the general manager of the Chicago, Burlington & Quincy, as assistant to the general superintendent of the First district of the Frisco, as engineer for the Consolidated Coal Company at Baltimore, Md., and as president of the Baltimore Peach Bottom Slate Corporation at the same point. During the war he served from May, 1917, to April, 1919, first as a captain in the United States Army and then as a colonel. From 1919 to 1928 Mr. Gray was successively general superintendent and general manager of Montgomery, Ward & Co., Chicago, vice-president and general manager of the City Ice & Cold Storage Company, Kansas City, Mo., and vice-president of the Central Manufacturing District Bank, Chicago. On September 15, 1928, Mr. Gray was appointed manager of the industrial department of the Chicago & North Western, with headquarters at Chicago, his recent appointment to the general managership of the Omaha becoming effective on July 1.

W. C. Sloan, assistant to the operating vice-president of the Northern Pacific, has been promoted to general manager of the Lines east of Paradise, Mont., with headquarters as before at St. Paul, Minn., succeeding **T. H. Lantry** who has been transferred to the Lines west of Paradise, with headquarters at Seattle, Wash. Mr. Lantry replaces **Arthur V. Brown,** who retired from active duty on July 15 after completing 45 years of railway service. Mr. Sloan was born on July 9, 1886, and after attending Cornell University entered railway service as an inspector on the New York tunnels of the Pennsylvania in February, 1907. During the following year Mr. Sloan was connected with the Brooklyn Rapid Transit Company and on April 1, 1909, he entered the service of the engineering department of the Northern Pacific. During the following six years he filled a number of positions in that department and in 1915 he was appointed trainmaster at Forsyth, Mont., where he remained until 1917 when he was promoted to division superintendent at Pasco, Wash. From 1917 to 1919 Mr. Sloan served overseas in the World war as a captain in the United States Army and at the close of hostilities he was successively superintendent of the Rocky Mountain, Pasco, Yellowstone and Lake Superior divisions. He was appointed assistant to the operating vice-president in July, 1927, his promotion to general manager of the lines east of Paradise becoming effective on July 15.

Mr. Brown has been connected with the Northern Pacific for nearly 20 years. He was born at Hannibal, Mo., on June 5, 1866, and entered railway service in June, 1884 as a clerk in a joint freight station of the Missouri-Kansas-Texas and the Wabash. From 1886 to 1908 Mr. Brown served successively as stenographer and fuel clerk in the office of a superintendent of the Katy, as a stenographer in the office of the general superintendent of the Missouri Pacific, as a maintenance of way clerk and storekeeper on the St. Louis, Iron Mountain

W. C. Sloan

& Southern (now part of the Missouri Pacific), as a clerk, chief clerk and secretary in the offices of various operating officers on the Chicago, Burlington & Quincy and as assistant superintendent at St. Joseph, Mo., and division superintendent at Hannibal on the Burlington. He was then appointed general manager of the Missouri & North Arkansas at Eureka Springs, Ark., and in November, 1909, he was appointed su-

Arthur V. Brown

perintendent on the Northern Pacific at Livingston, Mont. Five years later Mr. Brown was promoted to general superintendent of the Central district at Livingston and in 1920 he was transferred to the Western district at Tacoma, Wash., where he remained until April, 1922, when he was appointed acting general manager of the Lines west of Paradise, with headquarters at Seattle. Mr. Brown was promoted to general manager of those lines in August, 1924.

Traffic

R. W. Reynolds has been appointed commissioner in charge of the agricultural development and colonization department of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Chicago.

Donald J. Price, general passenger agent of the International-Great Northern and the San Antonio, Uvalde & Gulf, with headquarters at Palestine, Tex., has retired from active service, effective August 12.

C. M. Davis, division freight and passenger agent at Hutchison, Kan., and **R. W. Moss,** commercial agent at Tampa, Fla., for the Missouri Pacific, have been promoted to general agents of the freight and passenger departments at the same respective points.

H. J. Schwietert, general development agent of the Illinois Central, has been appointed general agricultural agent in charge of agricultural development and colonization, with headquarters as before at Chicago. **Mark Fenton** has been appointed general industrial agent, with headquarters at Chicago.

David H. Hoops, who has been promoted to assistant traffic manager of the Chicago & North Western, with headquarters at Chicago, has been connected with that railway for 44 years. He was born on June 21, 1869, at Chicago and attended the South Division High School in that city. He entered railway service in 1885 as a junior clerk in the accounting department of the North Western and three years later he was transferred to the traffic department. From 1895 to 1917 Mr. Hoops was advanced successively through the positions of chief clerk to the general

David H. Hoops

freight agent, general agent at Des Moines, Iowa, acting general agent in the freight department, general agent in the passenger department and general agent in the freight and passenger departments at Denver, Colo. In 1917 he became division freight and passenger agent at Chicago, then being promoted to general freight agent, with headquarters at Chicago, in May, 1921. His further promotion to assistant freight traffic manager became effective on July 9.

Engineering, Maintenance of Way and Signaling

W. G. Kemmerer, master carpenter on the Eastern division of the Pennsylvania at Alliance, Ohio, has been promoted to assistant engineer in the office of the chief engineer of maintenance of way of the Western region at Chicago.

W. Rogers, superintendent of telegraph of the Missouri Pacific, with headquarters at St. Louis, Mo., has also been appointed superintendent of telegraph of the Gulf Coast Lines and the International-Great Northern. **G. L. Robertson,** assistant to the superintendent of telegraph of the Gulf Coast Lines and the International-Great Northern, has been appointed assistant superintendent of telegraph of those railroads.

L. J. Drumeller, assistant division engineer of the Russell division of the Chesapeake & Ohio at Russell, Ky., has been promoted to division engineer of the Hinton division, with headquarters at Hinton, W. Va., succeeding **H. L. McCutcheon,** deceased. **J. W. Knapp, Jr.,** supervisor of track at Richmond, Va., has been appointed assistant division engineer of the Russell division, succeeding Mr. Drumeller.

Mechanical

Fred W. Oakley, master mechanic on the Louisville & Nashville at Ravenna, Ky., has been transferred to Corbin, Ky., succeeding **Harry Feather,** deceased.

G. R. Wilcox, master mechanic of the Salt Lake division of the Los Angeles & Salt Lake, with headquarters at Milford, Utah, has been transferred to the Los Angeles division, with headquarters at Las Vegas, Nev., succeeding **J. E. Norris** who has been transferred to the Salt Lake division to replace Mr. Wilcox.

C. O. Shull, assistant master mechanic in the Eastern region of the Pennsylvania at Altoona, Pa., has been promoted to master mechanic of the Conemaugh division, with headquarters at Sharpsburg, Pa., succeeding **G. S. West,** who has been transferred to the Buffalo division, with headquarters at Olean, N. Y. Mr. West replaced **E. L. Bachman,** who has been transferred to Harrisburg, Pa.

Purchases and Stores

W. E. Wilford, assistant purchasing agent of the Ontario district of the Canadian Pacific, has been promoted to purchasing agent of that district, with headquarters as before at Toronto, Ont.

B. M. Winegar, general tie agent of the Canadian Pacific, with headquarters at Montreal, Que., has resigned to become assistant to the president of the Canadian Creosoting Company, with headquarters at the same point.

John Runnells, Retired Pullman Chairman, Dies

John Sumner Runnells, three months after his retirement as chairman of the board of directors of the Pullman Company, died at his summer home at Chocorua, N. H., on July 11, in his eighty-fifth year. Mr. Runnells' death followed a day's illness and except for a paralytic stroke several years ago he had recently enjoyed good health.

In the succession of presidents of the Pullman Company Mr. Runnells followed Robert T. Lincoln, when he became chairman of the board, in 1911 and preceded Edward F. Carry, when Mr. Runnells succeeded to the chairmanship in 1922. He was perhaps the last officer of the operating unit of Pullman who was closely allied with the founder, George M. Pullman, and who knew intimately his ideas and plans for the future of the company. As general counsel for 11 years before Mr. Pullman's death in 1898 he served as his personal legal advisor.

During Mr. Runnells' incumbency as president, the activities of the operating unit of Pullman experienced a decided expansion. While there was no appreciable difference in the mileage of railways covered by contracts for operating cars, this figure varying from about 215,000 to about 220,000 miles, there was an increase in other operating indicators. The total number of cars owned and controlled increased from 5,912 in 1911 to

John Sumner Runnells

7,674 in 1922. Passengers carried increased from 21,655,052 in 1911 to a record number of 40,752,262 in 1920 while the car mileage rose from some 625,000,000 in 1911 to more than 814,000,000 in 1921. As president of Pullman Mr. Runnells'

jurisdiction also covered the manufacturing activities which were not segregated until 1924.

Mr. Runnells was born on July 30, 1844, at Effingham, N. H., and graduated from Amherst College in 1865. Shortly after that time he moved to Iowa where he served for two years as private secretary to the governor of the state. This launched him on a public and legal career which included the positions of consul at Tunstall, England, from 1869 to 1871, reporter for the Iowa supreme court from 1875 to 1881 and United States district attorney for Iowa from 1881 to 1885. He was admitted to the bar in 1871 and practiced law at Des Moines, Iowa, from that date until 1887.

In the latter year he became general counsel for the Pullman Palace Car Company at Chicago, the former name of the Pullman Company. In 1905 he was elected vice-president, in 1911 he was elected president, in 1922 he became chairman of the board and in April, 1929, he retired from the latter position. Mr. Runnells had also been active in politics. While at Des Moines he served as chairman of the Iowa State Republican committee for two years, as a member of the Republican National committee for four years and in 1880 was a delegate to the Republican National convention. He was recognized as an authority on railway, telegraph and corporate law, in which he had specialized in his early life.

Obituary

Louis E. Bean, chairman of the Public Service Commission of Oregon, died at his home at Salem, Ore., on July 5.

J. B. Hotson, superintendent of bridges and buildings of the Elgin, Joliet & Eastern, with headquarters at Joliet, Ill., since 1916, died at his home in that city on June 25, following a heart attack.

Dr. Frank K. Ainsworth, chief surgeon and manager of the hospital department of the Southern Pacific who retired from active duty in October 1926, died at his home at San Francisco, Cal., on July 5 at the age of 73 years. Dr. Ainsworth had been connected with the Southern Pacific for 46 years and had been superintendent and manager of the hospital department at San Francisco since 1903. He held the position of chief surgeon from 1920 to 1926.

Henry S. Stebbins, vice-president and general manager of the Midland Continental, with headquarters at Jamestown, N. D., died at the Trinity hospital in that city on July 8 after an illness of several weeks from cancer. Mr. Stebbins had been in railway service for 37 years. He was born at Canandaigua, N. Y., on March 10, 1864, and entered railway service in 1887 on the Bath & Hammondsport. From 1898 to 1909 he served the Erie successively as agent at Seattle, Wash., general agent at Philadelphia, Pa., division freight agent at Elmira, N. Y., and Rochester, assistant general eastern freight agent at New York, general manager of the Erie Despatch at Chicago and general eastern freight agent at New York. He then became traffic manager of the General Motors Company in 1914 was elected a vice-president of the S. G. V. Company at Reading, Pa. From 1914 to 1916 Mr. Stebbins was general manager and receiver of the South Dakota Central (now part of the Great Northern) at Sioux Falls, S. D., and since the latter date had been vice-president and general manager of the Midland Continental.

Charles J. Wilson, a former division superintendent on the Chicago Rock Island & Pacific and the Northern Pacific, died at his home at Estherville, Iowa, on July 10 at the age of 74 years. Mr. Wilson, was born at Gibbsville, Wis., and after attending public schools at McGregor, Iowa, entered railway service as an agent and operator on the Chicago, Milwaukee & St. Paul in 1875. He held various positions in the operating departments of the Milwaukee, the Chicago, St. Paul, Minneapolis & Omaha and the Northern Pacific during the next 18 years and in 1893 he was promoted to superintendent of the Dakota division of the latter road. From 1903 to 1912, when he retired from active service, Mr. Wilson was superintendent on the Rock Island at Fairbury, Neb., and at Estherville.

John H. Clegg, superintendent of the Salvador division of the International Railways of Central America, with headquarters at San Salvador, Salvador, and a former railway officer in the United States, died in that city on July 9 from injuries received in a train accident. Mr. Clegg had previously served as superintendent of the Ray & Gila Valley at Kelvin, Ariz., and on the Mexican Central (now part of the National of Mexico) as superintendent at Aguascalientes, Aguas., and as trainmaster at Ciudad Juarez, Chih.

William L. Breckinridge, who retired in 1923 as assistant chief engineer of the Chicago, Burlington & Quincy, after 44 years of service with that railway, died at his home in Chicago on July 11 following an extended illness. Mr. Breckinridge was born at Louisville, Ky., on June 29, 1857, and graduated from Washington University in 1879. In July of that year he entered railway service as a rodman on the Burlington. During the next 20 years he was promoted successively to assistant engineer, division engineer, at Burlington, Iowa, engineer of the Iowa lines and superintendent of those lines. In 1899 he was promoted to chief engineer of the lines east of the Missouri river, with headquarters at Chicago, a position he held until 1918 when he was appointed chief engineer of the Burlington System for the United States Railroad Administration. Upon the return

William L. Breckinridge

of the railroads to private control in 1920 Mr. Breckinridge was appointed assistant chief engineer of the system, with headquarters at Chicago. He retired because of ill health in April, 1923.

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Car Distributors on the Rock Island at Chicago Using Modern Office Appliances as Part of Their Working Equipment